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Agriculture.

AGRICULTURAL EDUCATION FOR WOMEN.

For a long series of years the emancipation of women from their centuries of long exclusion from any but household duties has been advocated by far-seeing leaders of the movement in all countries of the world. In many European countries the peasant farmer's wife and daughters were obliged to assist in various ways in the field, in the stall, and in carrying the produce to market, in addition to attending to household affairs.

It has remained for the present European war to bring women's work more in line with that of men in many ways which would never have been dreamt of four years ago. No longer do parents think it degrading to let their daughters attend to the orchard, the dairy, poultry yard, or apiary. It has been found that women are capable also of very strenuous work in foundries, munition factories, as well as on the farm and market garden. They have largely taken the places of men who have joined the army in such capacities as railway porters, tram and omnibus conductors, letter-carriers, and are engaged in a host of employments which previously were considered to be only fit for strong men and lads. Nor is this now universal employment differentiated by rank and position in life. Ladies of high social standing are now working like their sisters in less fortunate circumstances in factories, laundries, warehouses; in the field; on the roads; in all sorts of employment—all working long hours, in many cases as much as twelve hours a day, and that often for seven days in the week. Thus has been, once for all,

exploded the theory that women are not fitted for any but household employment.

Here is an example of what the women of England are doing at this time of writing:—"The Devon Women's Agricultural War Committee organised a ploughing and agricultural demonstration for women at Ketterton, Exeter, England, which was attended by a large concourse. There were nearly 100 competitors for prizes in ploughing, rolling, harrowing, milking, sheep-shearing, harnessing, &c. The champion ploughing prize was won by a girl only fifteen years of age. The sheep-shearing was pronounced by the judges to be remarkably well done, many farm men being unable to do as well."

In the year 1900 the Russian Imperial Society for the Development of Agricultural Education took the matter in hand at the National Congress held at Moscow. From all parts of the Empire there was a cry for ladies with an agricultural education. The head of the movement was Professor Stebut, and he met with enthusiastic support amongst Russian women. In many places private ladies established schools of rural and domestic economy for ladies. The peasant girls are being taught vegetable and fruit growing, rural economy, and agriculture. The more highly educated women undergo a three years' curriculum:—First year: Cattle-rearing, dairying, butter-making, and cheesemaking. swine rearing and feeding, poultry-farming, gardening, vegetable and fruit growing, horticulture, washing and ironing, spinning and weaving, sheep rearing and feeding, cutting up killed meat, the preparation of simple and of more complicated food; candle, soap, and starch making; jams, jellies, and preserved fruits, &c.; beekeeping; reading, writing, bookkeeping, and two languages. Second year: Mother tongue, letter-writing, bookkeeping, elements of hygiene, first aid in case of accidents, nursing the sick and wounded, elements of veterinary medicine, linen washing and ironing, salting and smoking of meat, &c., &c.

Ladies efficient in the above subjects complete their technical education by getting lessons in growing ornamental trees and in landscape gardening, botany, zoology, chemistry, mineralogy, and drawing. All those theoretical subjects are accompanied by practical work and demonstrations.

At the expiration of three years the pupils are severely examined, and if found efficient they receive a diploma to that effect. The fees are £20 per annum, which includes board, residence, and tuition.

Since the date mentioned the agricultural education of women has made great strides. It needs only a glance at the illustrated British journals to show how women of all classes have thrown themselves heart and soul into industrial work; and it is largely due to the self-denying work of these noble women that both British and their Allies have received the vast quantities of shells, machine guns, &c., which have enabled them to continually press forward towards the great objective—the destruction of German militarism and the freedom of Belgium, Northern France, and Alsace-Lorraine from the brutal rule of the Hun.

The women of Australia are also doing their utmost towards the same end, and all classes have vied with their sisters overseas in providing every possible thing for the alleviation of the labours and sufferings of those heroic Australian soldiers who are so gallantly fighting for not only Britain and her Allies, but for the salvation of Australia; for, if Germany should win in this war, then would Australia be practically enslaved, and the German would crush the hated Australian British with an iron hand.

ONION-GROWING.

The next two months are the most favourable for getting the seed in, so as to harvest the crop about the end of the year. To be successful with this crop it is necessary that the land proposed to be planted out, as well as the seed-bed, be turned up and exposed to the weather some months ahead of planting. If this is done, and frequent stirring made, most of the weed seeds will be induced to germinate, when complete destruction will be easy. The common practice of ploughing and putting the land in order just previous to planting cannot be too strongly condemned in onion culture, as weeds will cause endless trouble and expense. Getting the land into good order includes well rolling it, for an indispensable cultural condition for onions is to get the soil well firmed underneath without "panning" it. This condition is often lost sight of. If the soil is carefully worked, reduced to a fine tilth, and the plants are set out in a soil which has been loosened to a depth of, perhaps, 8 in., no good results can be expected without rolling. The onion requires a firm bed; otherwise the plant, instead of making a large, well-shaped bulb, will run to "neck," and have more the appearance of a leek than an onion.

The most suitable soil is a rich sandy loam, free, friable, and easy to work—a soil that will not cake, and not lying so low as to retain the superabundant moisture after heavy rains. In the latter case, the land should be well drained. An eastern or south-eastern aspect has been proved to be better than if the land sloped to the west, as the onion does not require intense heat to bring it to perfection.

The best way to sow onions is to drill them in, although for small areas the seed may be sown in a seed bed and the young seedlings planted out. The drills should be from 8 in. to 15 in. apart, which will require from 2 lb. to 10 lb. of seed per acre. The seed should be dropped at a distance of 2 in. to 3 in. apart in the drills, and the plants will afterwards be required to be thinned out with the hoe to 6 in. apart in rich land. The drills should be slightly raised, and the *roots* of the plants be firmly embedded in them. The *bulb* is not the *root*, and it should be allowed, so to speak, to squat *on* the surface, not *under* it.

When sowing the seed, it need only be put just under the ground, as it requires but a very slight covering of soil. If sown deep, many seeds fail to germinate, and most of those that do appear will make an

abnormal growth of neck, causing much labour in drawing away the soil from the incipient bulbs. There are few seeds so annoyingly deceptive as onion seeds, as old seed loses its germinating power, and imported seed, unless carefully packed in airtight bottles or soldered tins, will scarcely germinate at all. Therefore, it is well to make sure of getting new seed. After sowing, germination should take place in about a week, and the onion comes to maturity in from 120 to 180 days (spring onions in from 60 to 90 days). As the plant grows, the soil must be kept perfectly clear of weeds; and where the working of the ground has thrown the soil against the bulbs, it must be drawn down so that only the roots are in the ground. Where this has not been attended to, the remedy for the resulting want of bulb-formation is to wring the necks of the plants, or, at least, to bend them down with a twist. This will have the effect of inducing the formation of bulbs. Onions may be known to be ripe by the drying up of the tops. As soon as this happens pulling should be done quickly, because, if wet should come on, the bulbs may start a fresh root action. This, besides making them harder to pull, will seriously impair their quality. After they are pulled, the onions are left in narrow "windrows" to get well dried and ripened, and may then be removed to a dry barn, subject to a free current of air. Should they show any sign of heating, they must be at once turned over, and the bad ones picked out. The best varieties for our Queensland climate are Mammoth Silver King, Brown Spanish, Brown Globe, Yellow Globe, and Silver Skin. For spring onions sow White Tripoli in drills about 9 or 10 in. apart. Beyond a little hoeing in summer, they require no attention.

Sometimes the crop suffers from the ravages of a green grub which is numerous in some soils, especially in badly tilled ground. These come forth at night, and cut the young plants off level with the surface. One of the best preventives is to use the hoe frequently, by which means the green grubs, wire worms, &c., are brought to the surface in view of birds, which soon destroy them.

Thrips are a small, pale-green, elongated insect, belonging to the family of fringe-winged flies, which bite the plants, leaving small white specks on the foliage. On tearing the foliage open, minute green elongated insects are found. These are thrips. The onion being a very delicate plant, the sprays used on fruit trees cannot be employed. Roughly cured tobacco leaves made into a decoction of 1 lb. of tobacco in 2 gallons diluted to 4 gallons for use, with a little soap or molasses added to make it adhere to the plants, may be safely used for the destruction of thrips. It would pay all farmers and market gardeners to grow a patch of tobacco for use as an insecticide.

STORING ONIONS.

In the event of a slow, over-stocked market, onions may have to be held over for a rise. The chief difficulty in this case is their liability to sprout; and it is well known that whenever onions are stored in a damp building they are almost certain to sprout, even if the temperature is

nearly down to freezing-point. This has to be avoided, because, whenever growth is set up in any bulb or seed, that bulb or seed deteriorates in proportion to the extent of growth. Onions, when pulled, should not be stored away at once, but should be left on the ground for a few hours to dry. Then they should be put away dry, in the coolest shed or barn available. They require constant looking over to sort out any bad ones, for, as in the case of fruit such as oranges, apples, pears, &c., a single rotting onion will infect all those in its immediate neighbourhood. In an article in a French journal mention is made of an experiment which deserves the attention of farmers and market gardeners. Experiments with onions were made on ten plots manured with chemical fertilisers, and the resulting crops were put away in bags and carefully numbered, with a view to planting them out in the following spring to obtain seed from them. When the time for planting had arrived it was found that, under identical conditions of temperature and light, certain lots had sprouted and were exhausted by young, premature shoots, whilst the other lots still remained hard and solid without a trace of a shoot. The collection having been carefully ticketed, it was easy to prove that the produce from plots deprived of sulphate of potash were exhausted by a too hurried vegetation, whilst that which had received the potash manure was perfectly preserved. One hundredweight of sulphate of potash per acre will have the effect above described. Meanwhile, until after the war, potash is unobtainable.

A good manure for onions is a light dressing of dung, supplemented by 4 to 6 cwt. of superphosphate, 1 cwt. of sulphate of potash (or 4 cwt. of kainit), and 4 cwt. of nitrate of soda. Potash is of vital importance

GROWING FOR SEED.

Inferior seed is the source of frequent losses in onion culture, and many gardeners and onion specialists in Europe and America raise their own seed. The best bulbs are selected at harvest time. A short neck is considered an advantage. Uniformity in all the essential characteristics is exceedingly important in choosing bulbs for seed purposes. Seed bulbs should be carefully stored as above described, and should be planted in the autumn. The ground should be only moderately fertile, especially in nitrogen. Furrows are made 4 or 5 in. deep, and 14 to 30 in. apart, depending upon the method of cultivation. After placing the bulbs about 6 in. apart in the bottom of the furrow, they are covered with a hoe or small plough. The long slender seed stalks should have some support, which may be provided in two ways:—(1) By ridging with soil to the height of 7 or 8 in., which is the usual plan; and (2) by driving stakes at the end of the rows and at frequent intervals, and then stretching strong twine on either side. When mature, or ripe, the heads turn yellow. At this stage they should be removed promptly, with 6 to 8 in. of the stalk, before any seed is lost. As the tops do not ripen at the same time, it is necessary to make several cuttings to prevent loss. A basket with a cloth lining should be used in collecting the seed. The tops are spread in an airy room with a tight floor until dry enough to separate with a flail or by other means. Winnowing will remove most of

the chaff. The seeds may then be placed, a few pounds at a time, in a vessel of water. The heavy seeds which sink are saved, while the light ones and the remaining chaff are poured off. After thorough drying and curing, the seeds may be stored in any dry room.

THE PECULIARITIES OF COTTON VARIETIES.

By A. M. SOULE, Georgia State College of Agriculture.

The farmer who cultivates cotton is probably interested in two things—first of all, the quantity and quality of the lint he can obtain; and, second, the character and value of the seed produced. Of course, the lint brings in the larger revenue, and naturally his attention would centre in this item first of all; though, strange to say, probably nothing like as much consideration is given to this important subject as it deserves. The chances are that very few farmers have studied varieties of cotton and are acquainted in any sense with the wide variation in the essential characteristics which are shown, even where a test of these varieties be made on soil of uniform type and quality, and fertilised and cultivated in the same manner. Relatively speaking, much less attention has been given to a study of cotton seed than to lint; yet some very remarkable differences in the character and yield of seed obtained from different varieties of cotton have been recorded; and in fact they mean so much in a financial way to the farmer that some suggestions along this line may not be out of place.

In a variety test made on the College Farm in Athens, Georgia, in 1912, the following data were secured:—One variety from the first picking yielded 1,445 lb. of seed cotton; from the second picking, 680 lb., and from the third picking, 21 lb. This was a total yield of 2,146 lb. of seed cotton per acre, or 901 lb. of lint per acre. It took 4,000 seeds to make 1 lb. The length of the staple was 15/16 of an inch; the per cent. of lint, 40; and the per cent. of disease, 2. Growing alongside this cotton was another strain, which yielded 701 lb. of seed cotton from the first picking, 212 lb. from the second picking, and 21 lb. from the third picking. The total yield of seed cotton per acre was 934 lb. The yield of lint was 280 lb. The lint, however, was 17/16 in. in length. The per cent. of lint fell to 36, and the per cent. of diseases ran up to 20. Notice the astonishing contrast between these two varieties of cotton, and if you are farming go out into the field and make a few observations for yourself, and see which one of these strains the variety you are growing most nearly corresponds with.

In this instance observe that there was more than three times as much lint produced by the first variety as by the second. A part of the difference between these strains was no doubt due to the high per cent. of disease. The yield of seed from the two strains also showed a marked difference. Undoubtedly the seed from the first variety was more desirable for planting and for milling than from the second variety. The reason is obvious: there was a smaller percentage of disease. In the case of the first strain, practically all of the cotton was got out with the second picking, thus insuring its perfect maturity before frost. These are advantages of great concern to the farmer, for his

seed are worth more for manufacturing purposes than that derived from an inferior strain of cotton, and they will also germinate better; and his chances of securing a stand the next year are greatly enhanced thereby.

Observations made on the college farm show that the number of bolls required to make 1 lb. of seed cotton varied from 54 up to 105; that the number of seeds to the lb. varied from 2,688 to 6,100. There was also a marked variation in the length of the lint and in the per cent. of disease. The seed must be in perfect condition in order to produce a fine quality and quantity of lint. Therefore, their study and consideration become matters of the utmost importance. Those strains which will enable the farmer to produce the largest quantity of medium to large-sized, sound, wholesome seed, high in oil and protein, should be selected for planting. Study along this line will enable much information to be gained and much progress to be made. In view of the large interests involved, it is time that attention was directed to this matter. Every farmer should go into his field and study his crop carefully and compare it with his friends' and neighbours', and so be in position to select seed from the most vigorous and productive types and which produce seed and lint of a desirable quality. As he selects and improves his strain of seed, they will command a higher and higher price for manufacturing purposes, and he will gain the monetary advantage which is certain to accrue to him from producing a better quality of lint and seed.

The farmer should also select his seed with the idea of early maturity —that is, getting the largest amount of lint and seed from the first picking. In this respect a wonderful variation is shown in varieties. As already noted, only 21 lb. of seed cotton was obtained from the third picking of the two strains mentioned above. On the other hand, varieties grown alongside these strains yielded from 170 to 382 lb. from the third picking. Naturally, there was a corresponding low yield from the first picking. In fact, several of the varieties produced from the first picking from 1,020 to 1,445 lb. A failure to emphasise earliness results in the production of a large quantity of undesirable lint and imperfect seed. Both of them are of much less value than they would be in varieties where early maturity has been emphasised.

These facts would indicate that a number of the most desirable qualities in the production of seed of a superior value for milling purposes, and of a lint which will command a premium on the market, can be successfully correlated in varieties of cotton through the exercise of patience and skill in seed selection. This work is entirely practicable for the average farmer, and will result in a variety of benefits. The issues involved are of very great importance and cannot be over-emphasised in view of the approach of the boll weevil* and the relatively high cost of labour and fertilisers now entailed in the production of cotton. To meet the new conditions of production which circumstances have placed upon the farmer, he must increase his yield of lint and improve the quality of his seed. The suggestions made will be helpful in this direction.—"Press Bulletin."

* This refers to the American boll weevil. Fortunately this pest has never appeared in Queensland —[Ed. "Q.A.J."]

The Orchard.

A WINTER MELON.

THE CASSABA.

There is a class of musk melons grown in the United States of America known as Winter Musk Melons (*Cucumis melo*, var. *inodorous*), which, if picked before frost and stored in a cool place, ripen up very slowly, often keeping until after Christmas time. These melons are of a sweet melon flavour, and are valuable for their long-keeping qualities. Amongst the best are: Winter Climbing, Nutmeg, White Antibes, Pine-apple, and Golden Beauty, of which latter we give two illustrations.

When Mr. W. H. Mobsby was at the Panama Exposition in San Francisco, he obtained some seeds of the winter melon known locally as "Cassaba," and since his return he has succeeded in raising some plants which have lately fruited. From his description of the Cassaba it appears that in the United States the fruit ripens in July, and continues bearing and ripening all the summer and autumn until the frosts come. The fruit can be stored in a cool place, and it will ripen slowly, so that they can be marketed from time to time until late in January (in the U.S.A.). The fruit is of a bright yellow colour, nearly globular in shape, with a wrinkled skin, and is slightly pointed at the stem end. In size the fruits vary from 6 to 8 in. in diameter. The flesh is pure white and very thick, as shown in the illustration. Such a class of fruit would travel well, and could be placed in a perfectly sound condition in the markets of the Southern and Western States of the Commonwealth. The seed should be sown in Queensland after all danger to the young plants from late frosts is past—say, at the end of August or in September.

Whilst in San Francisco, Mr. Mobsby had a full opportunity of observing the many fruits grown in California, and how the American "boost" their vine production. Each of the principal fruits has a special day when in season, such as Orange Day, Prune Day, Melon Day, &c., and to such an extent do they patronise such productions that instructions are given as to how to place the fruits on the show tables, and such fruits are well advertised by the Californian Fruit Growers' Exchange, who act as the medium between the growers and the buyers. No other middleman is allowed in this important work; consequently the grower gets a fair price for his fruit, which is graded and distributed in the market, so that the consumer in turn gets full value for his money. Amongst other fruits the cassaba is a great favourite, and Mr. Mobsby considered it would be an ideal fruit for Queensland owing to its type and keeping qualities.

Plate A shows the fruit cut, and B a fruit raised at Indooroopilly by its introducer.

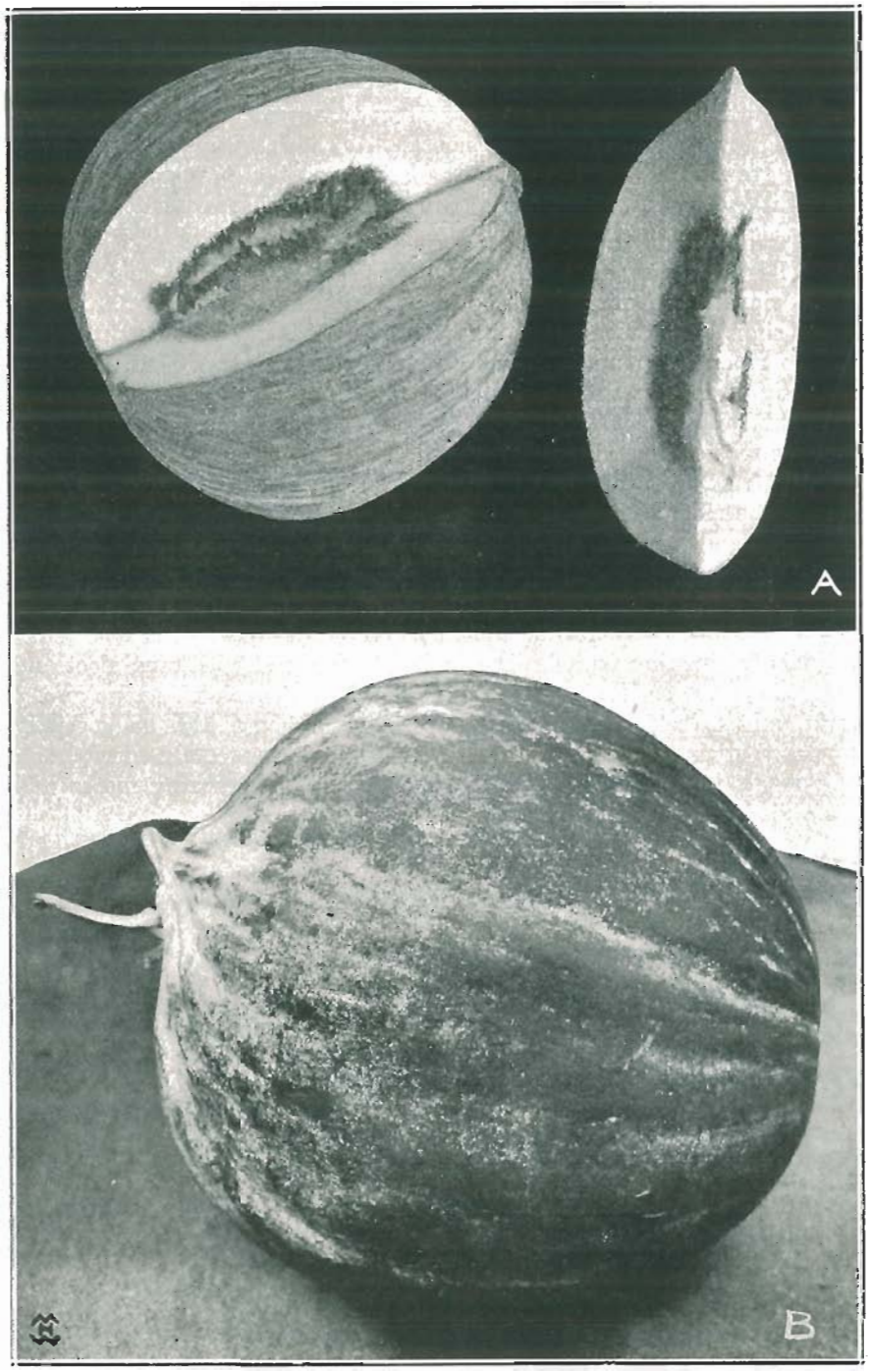


Plate 10.—The Cassaba : A Winter Melon.

TO TRAP ORANGE MOTHS AND FRUIT FLIES.

"Fruit World's" Queensland correspondent gives the following advice to citrus-growers, who will doubtless have trouble with these pests during the coming few months:—

"The fruit of the new crop of citrus trees will be showing signs of ripening towards the end of the month. As the fruit during this period of its growth is very liable to the attack of insect pests of various kinds, it is important that steps should be taken to prevent loss arising from this cause as far as possible.

"Large sucking moths of several kinds attack the fruit as soon as it shows signs of ripening; and, as they always select the first fruit that shows signs of colouring, it is a good plan to gather a few forward fruit and to ripen them up quickly by placing them on the barn floor and covering them up with bags or straw. They will turn colour in a few days, and develop the characteristic scent of the ripening fruit. The fruit so treated should be hung up in conspicuous places in the orchard as trap-fruit, as not only will it attract the moths but also the fruit flies. The moths will be found clustered round the trap-fruits in large numbers, and can then be easily caught and destroyed. Fruit fly will also puncture such fruit; and if the fruit is destroyed before the larvæ reach maturity, a later crop of these insects is prevented from hatching out. Fruit flies may also be caught in large numbers by means of such artificially ripening fruits. The fruits are smeared with tanglefoot and hung about the orchard. The fly, attracted by the colour, settles on the fruit, and is caught in a similar manner to house flies on specially prepared sticky paper. These simple remedies, if carefully carried out, will result in the destruction of large numbers of sucking moths and fruit flies."

DEPUCKERISING THE PERSIMMON.

The "Monthly Bulletin" of the California State Commission of Horticulture for January, 1917, describes a method of removing the astringent properties of the persimmon as practised in Japan, and mentioned in an article in the Bulletin on ripening the persimmon by Mr. Sumito Fujii. Mr. O. E. Bremner, Horticultural Commissioner, Sonoma County, says:—

"The Japanese have a method, the origin of which, as with all other such processes that have been handed down from generation to generation, is probably unknown. They take a soy tub which has just been emptied of the soy and fill it with persimmons, covering the top tightly. After a few weeks the persimmons are removed perfectly ripe and without the astringent property. Mr. Roeding tried this process, but says it is not practical on account of the difficulty in securing fresh soy tubs.

"The soy tub and the soy are not essentials to the process, although the Japanese believe they are. A simple manner and one perfectly effective is to place the persimmons in layers of chaff or fine straw or

hay in the boxes so as to exclude the light. The fruit will ripen in from two to six weeks, depending on its condition when picked. They may be gathered even before they have begun to take on the yellow colour and yet ripen so perfectly that they may be eaten like apples without even removing the skin. This is not strictly true of some of the seedlings, but does refer to the varieties mentioned in Mr. Fujii's article.

"It is not essential to the ripening of persimmons that they remain on the tree until slightly frosted. The longer they remain on the tree the higher the colour and the quicker they ripen. We usually put away about five lug boxes, each containing two or three layers of persimmons, according to the size of the fruit. When cured this way, persimmons make an elegant appetizer served either with cream or without."

GIRDLING OR CINCTURING FRUIT TREES.

There would appear to be some doubt in the minds of our fruit-growers as to the efficacy of girdling citrus and other fruit trees, as described in occasional articles which have appeared in this Journal, for the purpose of inducing the setting of the fruit. Some growers have reported that the method proved successful; others that no appreciable difference was observable in the crops produced by girdled and ungirdled trees in the same orchard. It would be very instructive if growers who have tried the system would give us their opinion on the subject for the benefit of other orchardists. In this way very valuable testimony *pro* and *con* could be placed before our readers.

REGISTRATION OF ORCHARDS.

Under the "Diseases in Plants Act," every orchard must be registered by the owners or occupiers thereof on or before the 31st day of March in every year. The form of application is to be filled in and forwarded to the Under Secretary, Department of Agriculture and Stock, Brisbane, on or before the date mentioned in each year.

An orchard is defined as "Any place within a fruit district where one or more fruit-producing plants are grown."

Forms of Registration of Orchards may be obtained from Clerks of Petty Sessions, or at the Head Office, Department of Agriculture and Stock, Brisbane.

Under "The Diseases in Plants Act of 1916" it is notified that "failure to comply with this section of the Act renders the occupier or owner liable to a penalty of not less than one pound nor more than five pounds for a first offence, and not less than two pounds nor more than ten pounds for any subsequent offence."

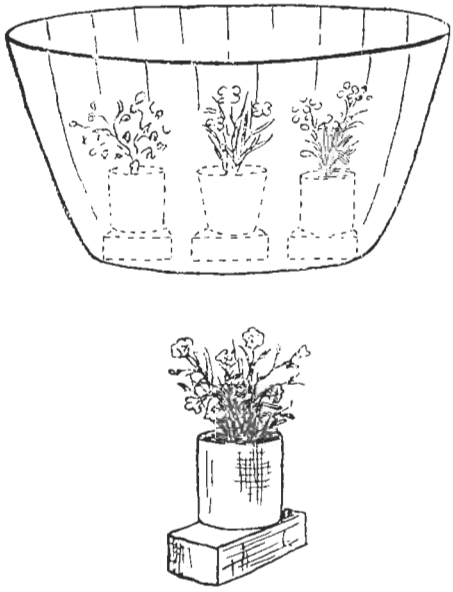
No fee is charged for registration.

Horticulture.

HOW TO KEEP POT PLANTS ALIVE WHEN ABSENT FROM HOME.

"South African Gardening and Home Life" is a very interesting and useful paper devoted to the interests of gardeners, amateur and professional. It is published monthly at Johannesburg, Transvaal; and each month three prizes (seeds or garden sundries to the value of £1 1s., 10s., and 5s.) are awarded to the reader who sends in the best dodge to save time and labour in any gardening operation. The following "dodge" was published in the February issue of the above journal, and deservedly obtained first prize. Many people in this State leave their homes for a week or two at holiday time, and there being no one to look after the garden or pot plants, the latter are liable to succumb to the want of water. The remedy is simple; but how many have discovered it?

"Take a large tub or pan and as many common bricks as there are plants. Place the bricks in the tub and just cover them with water; then



stand the plants on them. Being porous, the bricks will absorb the water, and the plants will draw up all the moisture they require and keep in good condition for some time.

"Trusting this hint will be of use to those of our readers who will be holiday-making this summer-time."

Viticulture.

RAISIN DRYING AND CURING—No. 2.

Taking Up.—When the raisins are sufficiently dried, they must be taken up as quickly as possible. This process, again, consists of three different labours—the stacking, assorting, and boxing. It is of great importance to know exactly when the raisins have sufficiently dried to be ready for the sweatboxes. This can properly be ascertained only by experience; still, a few directions will materially help. A perfect raisin should be neither too hard nor too soft. The raisin is too soft when, after rolling it between the fingers, the least particle of juice exudes through the cracked skin or meat. Such raisins will "sugar" in course of time, and will not keep a year. If the raisins or the majority of them on a bunch are too wet, they should be spread to the sun for some time longer. If, however, there are only a few underdried raisins in a bunch, the bunch may be taken in, and the soft raisins clipped off afterwards. A raisin is too dry when, in pressing and rolling it between two fingers, the pulp does not move readily inside the skin. Such overdried raisins will not again become first-class raisins; their skin will always be tough, and their colour will be somewhat inferior. If but slightly overdried they may be brought out by equalising. To know when the raisins are in a proper condition to take up is most important to every raisin man, and he should never neglect to watch his trays early and late. Upon his good judgment and watchfulness depends the quality of his crop.

To prevent too rapid drying out after the raisins are nearly ready, the practice now is to stack the trays in the field. This stacking simply consists in placing the trays which contain the ready raisins on top of each other in piles 5 ft. high. On the top of each pile are placed several loose trays crosswise, so as to shelter the pile from the sun, and possibly even from rain, and other trays are raised up against the sides of the pile in order to exclude as much air as possible. If, however, the raisins are rather underdried, the side trays may be left out so as to allow the raisins to dry more. It is always best to stack the trays before the raisins are fully dried, as they will finish drying and curing in the stack much better than in the sun. After the stacking is done, the assorting is in order. This consists in taking out every bunch that is not sufficiently dried to go into the sweatbox, and placing them on new trays to dry more. At this time also the bad or inferior and red berries may be taken out if present in a large quantity on good bunches; but when there are only a few on it is better not to touch the bunch, as, in handling, it is apt to break. The boxing and assorting, which may be considered together, consist in transferring the different grades of the now dried raisins to separate sweatboxes. This is done in two ways. The No. 1 bunches, which have been placed on separate

trays, may now be slid into the sweatbox. Between every two layers of these first-class bunches should be placed a clean paper, cut so as to exactly fit the box. It is of importance to have the paper to fit the box, and not to be too large or too small, as in either case the raisins may become mixed and the bunches broken. It must be remembered that the more paper is used the less apt are the bunches to be injured. On the top and in the bottom of every box must be one paper to keep out dust.

Covering.—If the weather has been favourable, the raisins may have been cured in twelve days. Of these twelve days the first seven or eight were used for drying the upper side of the raisins. On the seventh or eighth they were turned; and on the twelfth they were ready to put in the sweatboxes. But this is fast drying, and under favourable circumstances. It generally takes a longer time—from fourteen to twenty-one days. In Malaga they cover the raisin floors every night with canvas; and in the morning, when the canvas is unrolled, the raisins are yet warm. This method is to be recommended wherever there is any difficulty in curing the first or second crop. The method to be followed is to place the trays in rows; along and around the rows posts are driven, leaving 2 ft. clear of the ground. On one side (the south) the posts are not to project so high above the ground, so that the covering may be slanting; then by means of wires, rings, and canvas, a covering can be made which will protect the raisins from the dews of night and secure a uniform temperature for curing.

Dryers.—Dryers of different descriptions have from time to time been patented, and are for sale by various firms, as, for instance, Messrs. Ellwood, Cooper, and Co., of Santa Barbara, California, U.S.A., sell a dryer large enough to hold 1 ton of fruit for about £42.

The dryer is simply a wooden box with heating apparatus attached, about 17 ft. square and 6 ft. high, and looks from the outside like a chest full of drawers. These slide on frames, are deeper than they are broad, and contain movable bottoms or trays. The ventilation is had by small sliding doors at the bottom of the chest, through which the air rushes in, while it goes out through the drawers, which are open an inch or two for that purpose. Dryers are not for the purpose of entirely drying the raisins in them, but only to finish up the raisins when, on account of unfavourable climatic conditions, they do not dry any more out of doors. No one would think of drying raisins in the dryer altogether, as it would not pay. Raisins properly finished in the dryer are not inferior to those entirely sun-dried.

Sweatboxes.—These should be of 1-in. timber. The length and width should be according to the size of the tray, and always 1 in. larger every way than the tray, so that the raisins may be let down easily or that they may receive a tray. The height of a sweatbox should be from 6 to 8 in., no more. In order to secure the box and prevent it from splitting, the sides should be bound with iron or wire.

Trays for Drying.—The tray consists of a wooden frame made of well-seasoned ½-in. timber nailed to cleats 1 in. by 1 in. by ½ in., and of

the desired length. The size of the tray varies according to the idea of the raisin-grower; but the size generally adopted is 2 ft. by 3 ft. When the season is over, every tray should be nailed up and washed, or at least swept clean, and stored dry. The age of a tray, if cared for, is about ten years.

Boxes and Cartons.—There are three kinds of packages in use in the raisin market—whole boxes of 20 lb., halves of 10 lb., and quarters of 5 lb. The wholes and quarters are those most used; while the halves are seldom used or required. The cartons are made of paper, and contain 2½ lb. of raisins each.

The following are the measurements of raisin boxes and cartons, and of the timber required for making them:—

20-lb. box	$9 \times 18 \times 4\frac{3}{4}$ in.
10-lb. box	$9 \times 18 \times 2\frac{3}{8}$ in.
5-lb. box	$9 \times 18 \times 1\frac{3}{16}$ in.

The foregoing are inside measurements.

The tops and bottoms are ¼ in. thick, 19½ in. long, and 9¾ in. wide.

The sides of the 20-lb. box are 19½ in. long, 4¾ in. wide, and ⅜ in. thick. The ends of a 20-lb. box are 9 in. long, 4¾ in. wide, and ¾ in. thick.

The sides of the 10-lb. box are 19½ in. long, ⅜ in. thick, and 2⅜ in. wide. The ends of a 10-lb. box are 9 in. long, ¾ in. thick, and 2⅜ in. wide

The sides of a 5-lb. box are 19½ in. long, ⅜ in. thick, and $1\frac{3}{16}$ in. wide.

CARTONS.

The 2½-lb. carton is 5 in. wide, 10 in. long, and 1½ in. deep.

	Sides.	Ends.
20-lb. box ..	$19\frac{1}{2} \times 4\frac{3}{4} \times \frac{3}{8}$ ..	$9 \times 4\frac{3}{4} \times \frac{3}{4}$.
10 lb. box ..	$19\frac{1}{2} \times 2\frac{3}{8} \times \frac{3}{8}$ ..	$9 \times 2\frac{3}{8} \times \frac{3}{4}$.
5-lb. box. ..	$19\frac{1}{2} \times 1\frac{3}{16} \times \frac{3}{8}$.	

Lye-dipped Raisins.—This process is of considerable importance, especially in localities where the drying of the first crop is accomplished with difficulty in the open air. The first and also most important condition in producing superior dipped raisins is that the grapes should be absolutely ripe. Unripe grapes will not produce any good raisins when dipped, but will turn reddish and otherwise become inferior.

Dipping Process.—Water must be continually flowing while the operation of dipping lasts, and if it be not available in a natural state, it must be produced by artificial means. Flowing water is of great importance in producing good dipped raisins, and is required for the perfect washing of the grapes. The following is a cheap and efficient arrangement for dipping in actual use in one of the largest vineyards where running water is not available, and the system can be recommended on account of its cheapness and easy working:—On one side of the trough in which the grapes are dipped is a stationary iron kettle with a fireplace underneath. By the trough is also placed an upright post about 5 ft. high, and on this is balanced a horizontal beam with a double

motion. It can be raised and lowered at either end, or swung to the left or right with ease. On one end of the beam is a hook on which to hang the grape bucket. On the other side of the trough is a rough assorting table. Two or more buckets are needed. The buckets are common galvanised-iron buckets, perforated thickly with holes, the latter not large enough to let any loose grapes through. In the kettle, which is kept constantly boiling, is a solution of water and potash; soda is not suitable. The very best potash should be used, in the proportion of about 1 lb. to 12 gallons of water. The ripe grapes are now brought to the table and emptied into the buckets. A bucket is then hung on the beam, the latter swung round, and the bucket for a second lowered first into the pure water and then into the boiling potash; but it is immediately withdrawn and immersed in the water trough. When rinsed for a few seconds, the grapes are taken out and spread on common raisin trays. If the weather is warm, the trays are stacked one on top of the other, and the grapes thus prepared are dried in the shade. The rinsing of the fruit before drying is of great importance. In Valencia the finest raisins are treated in that way and thoroughly rinsed before being dipped in the lye. But nowhere in Spain are the grapes rinsed in water afterwards, and it is yet an undecided question whether the rinsing improves or injures the raisins. It is certain that the washing cleanses the berries, but whether it is an advantage to deprive the berries of the lye which more or less sticks to them is very doubtful. The arrangement of dipping kettles, &c., may, of course, be greatly varied. Steam may be used for heating the lye and the rinsing water, if it be desired to keep the latter hot; and regular trays might be used to hold the grapes instead of the buckets before mentioned. Every grower will, no doubt, vary these appliances to suit his own fancy and improve upon the method of others.

The length of time required for dipping can only be ascertained by experience, and must differ with the strength of the lye, with the heat of the solution, and with the thickness of the skin of the grapes. Thus, in different localities, the strength of the lye and the length of the immersion must always be different, and may even differ from year to year. When properly dipped, the skin of the grape must show some very minute cracks, similar to the cracks in glass which has been heated and suddenly immersed in or sprinkled with ice-cold water. Deep cracks are not desirable, as they will cause the juice of the pulp to leak out, after which the raisins will sugar. In Valencia the grapes used for dipping are the various varieties of Muscats; while in Smyrna both Muscats and Sultanas are used. Corinths are never dipped, as they dry readily and make superior raisins without this process.

Drying and Curing.—After the grapes are dipped, they must be immediately dried, either in the sun, or in the sun and shade alternately, or entirely in the shade. According to the circumstances attending the drying of the grapes the colour of the raisins becomes more or less red or yellow, transparent or opaque. The most perfect amber colour is attained in the shade; while in the sun the colour rapidly changes to reddish or to a less desirable colour in dipped raisins. The more

favourable the weather for drying the choicer will be the raisins and the better their colour. If the sun is very warm and the chances are otherwise favourable for drying, the trays should be exposed to the sun only long enough to have their dip thoroughly evaporated, and for this purpose one day may suffice.

After this, the stacking of the trays is advisable, and only occasionally may the trays be spread if the drying does not proceed rapidly enough. Such shade-dried dipped raisins will assume a beautiful amber-yellow colour, and will bring more per pound than those exposed to a very warm sun. If, however, the weather is not very warm, the grapes must be dried in the sun, and the grower has then to be satisfied with the colour that Nature will give to his raisins. Dipped raisins do not necessarily require turning, as they generally dry well in from four to six days in fair weather. For this class of raisins dryers are very useful to help finish the drying. Such dryers must be almost airtight, as storms would invariably spoil the raisins, which, on account of their stickiness, are almost impossible to afterwards cleanse. Dipped raisins should always be dried on their trays.

Stemming, Grading, and Packing.—Dipped raisins should be stemmed when well dried, and then graded in two grades. The proper receptacles for them are either sacks lined with paper or 20-lb. boxes, in which they may be packed without fancy paper or in the same way as prunes or other dried fruit.

CONSERVATION OF THE WINE DURING THE FIRST YEAR.

By G. A. GATTINO.

In my previous notes referring to the above subject, I mentioned that the substances contained in the air, excepting the oxygen, are dangerous to the wine, and therefore the wine to be transferrd should avoid contact with the air as much as possible.

For this purpose (and without submitting the wine to agitations) force or suction pumps are used with great advantage.

Recently, on the market, there are several kinds of well-improved pumps; but I do not want to describe them here or to recommend any of them. It remains for you to choose the one which can combine the efficacy of the work with the economy of the cost.

The casks into which the wine will have to be transferred must be completely full and hermetically closed, to prevent any air getting in contact with the liquid.

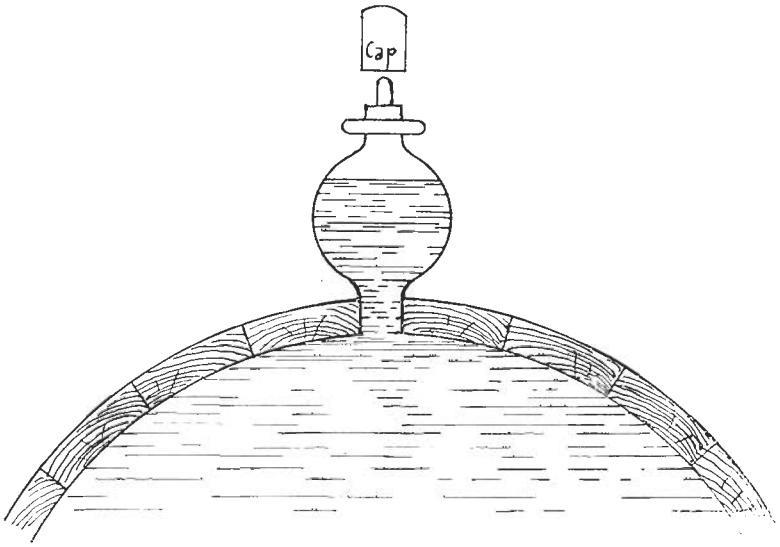
The wine in the casks, however, gradually decreases in quantity, either by absorption of the wood or by evaporation effected through the pores of the latter, or also by the escape of the carbonic acid from the liquid.

It is, therefore, necessary to remedy this loss of quantity by keeping the casks always filled; otherwise an empty space would be formed on

the superior part of the recipient, and this space would immediately be occupied by the air, with serious consequences to the wine.

During the first year such topping up will have to be made every week, using wine of the same quality purposely kept in separate jars.

There are various ways of topping up the casks. Generally, the wine is added through a funnel. This method will act if the recipients are of great capacity; but for small casks this direct down pressure would raise the sedimentations. A better result is acquired by a filler of glass as per illustration below—



As you see, it has a spherical form, and should have a capacity of a pint or a quart, whichever is the most suitable to the cask. Both extremities terminate in an opening. The bottom one is always open, and it is fixed to the bunghole of the cask. The top is provided with a glass stopper and a rubber cap.

By this method you can promptly see the diminishing level of the wine contained in the filler; and with a funnel, without prejudice to the mass, you can always add in the filler the quantity required for raising the wine to its original level.

The wine, after having been transferred, does not need any other care till next spring, except that of the topping up.

In the spring the wine must be racked, and the same rules described in last month's issue of the Journal have to be observed during this operation.

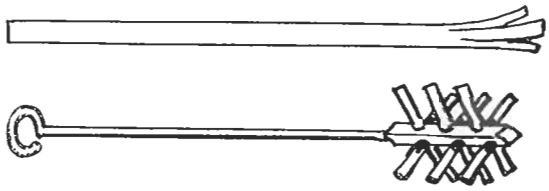
If a wine is kept to "ripen" (maturing it through age), then it should be racked twice every year—once in the spring and again in the autumn.

It often happens that the wine (to be sold during the first year), when it is racked in the spring, does not present that brilliancy which is one of the principal attributes of wine. This is because the wine contains azotated substances still in suspension or latent (concealed) ferment.

To prevent this inconvenience, there is adopted an artificial clarification. This clarification can be obtained by albuminous substances mostly drawn from animal solids and fluids. For instance, gelatine, isinglass, albumen of egg, blood of beef, milk. The gelatine or isinglass acts on the wine chemically and mechanically. They act chemically because they combine with the substances that the wine holds in solution and suspension, neutralising their action and preventing the development of the ferment. They act mechanically because they adhere to the particles existing in suspension in the wine, dragging them to the bottom of the cask. The albumen of egg acts in the same manner, but with greater efficacy. The blood of beef can be used either in its natural state or boiled in water, then dried up and reduced to powder. The blood has great and prompt effect, twenty-four hours being sufficient for making a wine perfectly bright. I would, however, not recommend this clarifier for table or fine wines, as the blood is easily alterable, and would transmit an unpleasant smell to those wines. The milk presents the inconvenience of making a very strong deposit, and is liable to ferment, thus producing the lactic acid. Personally, I am against the use of milk, and I would not advise its use for clarifying wines.

Besides the above-mentioned substances, there are on the market to-day several gelatines and powders specially prepared for the clarification of wines; but you have to make sure that their purity is guaranteed. I do not need to describe how to use those powders, because the necessary instructions are generally printed on the packets. I find, however, from long experience, that gelatine, albumen of egg, and blood of beef are the best methods.

The gelatine is used in the proportion of about 1 dram Av. per gallon. Cut into small strips the quantity of gelatine or isinglass used for the clarification; put the said strips into a glass or earthenware vessel; add boiling water, and agitate well for a quarter of an hour. When the gelatine is completely dissolved and is reduced to froth, pour this substance into the cask, and stir the liquid mass with a split stick or whip as per illustration:—



After having well stirred the wine, cork the cask, and leave it from ten to fifteen days. When you see that the wine is perfectly clear, transfer it into another cask, taking it away from the dreggy deposit formed by the clarification.

In using the albumen of egg, it is necessary to have fresh eggs and separate the albumen from the yolk just at the moment you have to use them. The white of an egg (albumen) is sufficient for clarifying 1 gallon of wine. Put the quantity of albumen you require into an earthenware dish, add a small quantity of wine, and agitate well until it comes all

froth. Then pour into the cask; and after stirring for about a quarter of an hour let the liquid stand. For facilitating the solubility of the albumen, add to the white of the eggs a pinch of salt.

In using the blood, practise the same method as for the albumen of eggs. Only very fresh blood has to be used, and about 2 drams Av. per gallon of wine. Do not use the blood as a clarifier for light wines, as it would weaken the latter too much.

Besides the clarifiers derived from animal solids and fluids, there are also others drawn from mineral substances, such as the allumine argil, special earth, &c. These clarifiers are cheap, but they must be first purified of all strange and impure substances, especially organic matter.

After applying any clarifier, the wine will have to be kept quiet for a certain time, so that the clarifying substances may produce the proper effect. When the wine is perfectly bright it must be racked off; otherwise the sedimentations would re-awake, rendering the clear wine again turbid. As a general rule, the "finings" will be effective only when the wine is complete, and all slow and sensible fermentations are finished. If, however, for trade purposes you have to make brilliant a wine not yet completely finished, then you will first have to stop the slow fermentation. This can be obtained by adding 3 drams Av. per gallon of metasulphite of potash. When all trace of fermentation is arrested, add the required clarifier to the turbid wine you have to finish off.

[TO BE CONTINUED.]

COTTON AND KAPOK FOR UPHOLSTERY.

An impression having gone abroad that kapok should be used for upholstery purposes, such as stuffing sofas, chairs, pillows, &c., instead of cotton, on the extraordinary ground that cotton is affected by disease germs, we would point out that cotton has been used in Queensland and in other parts of the world for these purposes for a long series of years, and no ill effects have ever attended its use. It is far more likely that kapok might carry disease germs, owing to the insanitary conditions under which it is grown, prepared, and baled for export in some tropical countries, where coloured labour is employed, and where such diseases as cholera, malarial fevers, skin diseases, smallpox, &c., are frequent amongst native labourers. Cotton in Queensland is grown and prepared under the best hygienic conditions, under the supervision of the Department of Public Health, so that it is practically impossible for Queensland-grown cotton or cotton-seed to be prejudicial to health. Kapok, on the other hand, may easily convey disease germs, since there is no supervision exercised over the gathering and treatment of the crop. Our cotton-growers, ever since cotton was largely grown in the State, have used cotton for stuffing mattresses, pillows, chairs, &c., and nothing was ever heard of the article spreading diseases. It seems to us that the impression has arisen owing to some trade rivalry, of which we know nothing, but users of cotton in any shape may rest assured that our cotton has never carried any disease germs.

Entomology.

THE LANTANA PEST.

A NEW FLY IMPORTED FROM HAWAII.

Many persons favour the lantana plant for its soil-fertilising properties, but in some districts in Queensland it has smothered extensive areas and constitutes a veritable pest. This fact recently led the Department of Agriculture, through its entomological scientists, to make investigations as to the means whereby it might be combated, and following on representations made by the Government Entomologist (Mr. H. Tryon), the assistant (Mr. H. Jarvis) visited Honolulu and Fiji to make further inquiry with respect to the lantana combating insect employed there, and to secure a number of the insects. Mr. Jarvis has now returned to Queensland, and Mr. Tryon stated that he had succeeded in safely transferring overseas a large number of lantana seed destroying flies. Some of them were secured in Honolulu and some in Fiji.

It was explained by Mr. Tryon that steps were being taken to establish the flies in three distinct localities where the conditions under which the host plant is growing differ notably in respect to climate and other conditions. The first district is that of Brisbane, the second the North Coast, while the remaining district will be the Mackay or Townsville areas. Insects were liberated in the Brisbane district on Monday and Tuesday, and on Wednesday the flies were being freed in the North Coast district. With regard to the experiment in the Northern area, Mr. Jarvis left Brisbane on Friday, 16th March, and the flies he would liberate would be those secured in Fiji. The Government Entomologist emphasised the fact that the outcome of these operations scarcely could be fully ascertained for a considerable time. Although the fly multiplied rapidly, the task before them is so enormous, and the area over which the lantana extends is so vast, that results could not be expected until a long period elapsed, provided that the flies subsisted under our climatic and other conditions. He felt, however, that there was every prospect of the project proving successful. He also pointed out that the introduction of the insect would present no interference with the use of lantana by those who desired to do so as a cover crop or as a means of honey production, and added that the habits of the fly so far as they relate to forms of vegetation other than lantana had also been under close observation for years. It was, therefore, possible to affirm that neither in its native home—Mexico—nor in any of the countries to which it has been introduced, has it ever associated itself injuriously with any plant other than lantana. There was no ground for any sugges-

tion that the insect was likely to change its habits, the experience being that in the absence of lantana no propagation took place, and that eventually it died. The fly laid numerous eggs, depositing a single one in the lantana berry while it was still green, and therefore it did not ripen properly, but dried up. The plant was not destroyed, but the seed, not coming to maturity, would no longer be available for the propagation of the plant and the extension of the infested area.

Mr. Tryon has assumed that the fly will be able to live under the climatic conditions of Queensland, but he is by no means confident that this will be the case so far as the southern localities are concerned. That was a matter to be determined by the experiments. The number of flies at present available is not sufficient to permit of immediate distribution to those who desire to use them for lantana repression. The Government Entomologist's first business is to establish them locally by colonising and breeding them. He stated that the fly was first procured by Mr. Albert Koebele, the well-known entomologist employed by the Hawaiian authorities to discover insects injuriously affecting the lantana plant and to introduce them into the Sandwich Islands. In the course of this undertaking he discovered the fly in Mexico, to which country lantana is indigenous. The insects were transferred to Honolulu, where they and other lantana-injuring insects were established. Eventually the fly was also established at New Caledonia and Fiji.

Mr. Tryon said that Mr. Jarvis's mission was most successful, and he had accomplished all that was expected of him. Thanks were also due to the official entomologists at Hawaii, who had done all they could to assist the undertaking.

DESTROYING NUT GRASS IN GARDENS.

The presence of this pernicious weed in small gardens disheartens many small householders to the extent of causing them to give up all hope of successfully raising either vegetables or flowers. Many requests reach us for information as to how the pest may be destroyed. It was pointed out at an agricultural conference held at Mackay in June, 1899, by Mr. W. Gibson, Bingera, that a patch of nut grass on rich soil was successfully destroyed by the use of molasses. A few casks of molasses were poured over it, and water on the molasses. It all fermented, and by keeping this going for a week the whole of the nut grass was destroyed, since which the land had been wholly free from it.

Mr. P. McLean said that a small area of nut grass may be completely eradicated by laying sheets of iron over it, so as to exclude it from light and air. This, he said, was on the same principle as Mr. Gibson's molasses. Both were effectual remedies, but, of course, it could only be done on small areas. We advise anyone having nut grass in a small garden to give these simple remedies a trial.

Dairying.

THE DAIRY HERD, QUEENSLAND AGRICULTURAL COLLEGE, GATTON.

MILKING RETURNS OF COWS FROM 27TH FEBRUARY TO 26TH MARCH, 1917.

Name of Cow.	Breed.	Date of Calving.	Total Milk.	Test.	Commercial Butter.	Remarks.
			Lb.	%	Lb.	
Sylvia II. ...	Shorthorn... ...	16 Jan., 1917	802	4·8	45 40	
Lady Margaret	Ayrshire	6 Jan. ,,	830	4·4	42·99	
Lady Melba	Holstein	14 Feb. ,,	1,035	3·4	41·13	
Miss Edition	Jersey	25 Dec., 1916	756	4·6	40 96	
Iron Plate ...	,, ...	9 Dec. ,,	615	5·1	37·04	
Twylish's Maid	,, ...	2 Nov. ,,	493	6·2	36·22	
Miss Bell ...	,, ...	1 Aug. ,,	475	6·4	36·04	
Comedienne	,, ...	24 Nov. ,,	466	6·2	34·23	
Violet's Peer's Girl	,, ...	13 Dec. ,,	507	5·7	34·20	
Lady Spec...	Ayrshire	17 Jan., 1917	710	4·0	33·34	
Constancy ...	,, ...	27 Dec., 1916	513	4·6	33·22	
Sweet Meadows	Jersey	18 Aug. ,,	404	6·5	31·14	
Lady Annette	Ayrshire	11 Nov. ,,	577	4·2	28·48	
Thornton's Fairetta	Jersey	26 May ,,	379	6·3	28·29	
Nina ...	Shorthorn... ...	23 June ,,	595	4·0	27·94	
Lady Dorset	Ayrshire	14 Sept. ,,	462	4·7	25·59	
Jennie ...	,, ...	27 Oct. ,,	494	4·4	25·58	
Queen Kate	,, ...	15 June ,,	492	4·4	25·48	
Hedges Dutchmaid	Holstein	22 Aug. ,,	469	4·6	25·41	
Bluebelle ...	Jersey	22 June ,,	430	4·8	24·33	
Glen ...	Shorthorn... ...	18 Jan., 1917	505	4·2	24·93	
Lilia ...	Ayrshire	4 Sept., 1916	412	5·0	24·30	
Belonda ..	,, ...	23 Feb., 1917	519	3·8	23·13	
Rosine ...	,, ...	16 July, 1916	397	4·9	22 94	
Nethertn Belle	,, ...	11 Mar. ,,	294	6·5	22 65	
Cocoatina ...	Jersey	6 Mar., 1917	407	4·3	20·59	
Skylark ...	Ayrshire	21 Mar., 1916	314	5·4	20·04	

The above cows were grazed on natural pasture only.

BREEDERS OF PUREBRED STOCK IN QUEENSLAND—BEEF AND DAIRY CATTLE.

The following list of breeders in Queensland of purebred cattle is published for the purpose of informing those who desire to improve their stock where the best cattle can be obtained in this State. The Department of Agriculture and Stock undertakes no responsibility in relation to the entries in the list; but, when making inquiries, the condition was imposed that the entries were to be comprised only of the stock that had been entered in a herd book or are eligible for entry.

The list as now published is incomplete; it includes the information received to date, and will be added to from time to time. Any owner desiring to have his stock included, should notify the Under Secretary of the breed of purebred stock he owns, the number of males and females entered or eligible for entry in a herd book, and the herd book in which they are entered:—

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
AYRSHIRES.				
Queensland Agricultural College	Gatton	14	45	Ayrshire Herd Book of Queensland
State Farm	Warren, Rockhampton	9	88	ditto
H. M. Hart	Glen Heath, Yalangur	6	15	ditto
L. H. Paten	Jeyandel, Calvert ..	8	20	ditto
J. H. Paten	Yandina	8	23	ditto
J. H. Fairfax	Marinya, Cambooya	9	55	ditto
State Farm	Kairi	4	8	ditto
F. A. Simpson ..	Ayrshire Stud Farm, Fairfield, South Brisbane	17	68	ditto
J W. Paten	Wanora, Ipswich ..	10	42	ditto (Includes 29 cows in advanced register.)
J. Holmes	"Longlands," Pittsworth	6	20	Ayrshire Herd Book of Queensland
JERSEYS.				
W. Siemon & Sons Ld.	Roma st., Brisbane ..	6	60	Queensland Jersey Herd Book
Queensland Agricultural College	Gatton	13	30	ditto
W. J. Barnes	Cedar Grove ..	10	27	ditto
W. J. Affleck	Grasmere, N. Pine ..	6	31	ditto
M. W. Doyle	Moggill	4	12	ditto
State Farm	Kairi	6	40	ditto
James T. Turner ..	The Holmwood, Neurum	1	5	ditto
Robert Conochie ..	Brookland Jersey Stud Farm, Brooklands, Tingoora	9	21	ditto
G. A. Buss	Bundaberg	5	14	ditto
T. V. Nicholson ..	Windsor	2	8	ditto
Geo. H. Crowther ..	Montrose, Oakey ..	7	43	ditto
E. F. Fitzgibbon ..	Listowel, Oakey ..	7	30	ditto
M. F. and R. C. Ramsay	Talgai, Clifton ..	5	37	Jersey Cattle Society, Queensland
J. N. Waugh & Sons ..	"Prairie Lawn," Nobby	2	44	Queensland Jersey Herd Book
T. Mullen	Chelmer	3	20	ditto
J. C. Brimblecombe ..	"Lolworth," Kingsthorpe	1	13	ditto
James Strong ..	Woodlands	5	18	ditto
GUERNSEYS.				
Queensland Agricultural College	Gatton	2	2	Eligible but no Herd Book in Queensland

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
HOLSTEINS.				
Queensland Agricultural College	Gatton	3	10	Holstein-Friesian Herd Book of Australia
George Nowman ..	Wyreema	9	37	ditto
F. C. G. Gratton ..	Towlerton, Kingsthorpe	2	11	Eligible for entry in Holstein-Friesian Herd Book of Australia
State Farm	Kairi	1	2	ditto
R. S. Alexander ..	Glenlomond Farm, Columboola	3	1	Holstein Friesian Herd Book of Australia
S. H. Hosking ..	Racing Plains, Toogoolawah	2	23	ditto
C. Behrendorff ..	Inavale Stud Farm, Bunjurgen, *via* Boonah	5	10	ditto
ILLAWARRA.				
John Hardcastle ..	Dugandan	5	17	Illawarra Herd Book of Queensland
Hunt Bros.	Maleny	3	62	ditto
W. F. Savage ..	Ramsay	2	29	ditto
G. E. J. Chaseling ..	Brundah, Coolabunia	1	45	ditto
P. Biddles	Home Park, Netherby	3	14	ditto
A. N Webster ..	Yaralla, Maleny ..	5	65	ditto
A. Pickels	Blacklands, Wondai	4	79	ditto
J. P. Perrett & Son ..	"Corndale," Illawarra Stud, Coolabunia, *viâ* Kingaroy	4	52	ditto
H. Marquardt	Oak Villa Stud, Wondai	5	20	ditto
Wm Wyper	"Strathobi," Maleny, Landsborough	3	100	ditto
MILKING SHORTHORNS.				
A. Rodgers	Torrans Vale, Lanefield	3	18	Milking Shorthorn Herd Book of Queensland
Wm. Rudd	Airedale, Christmas Creek, Beaudesert	6	30	ditto
W. Middleton	Devon Court, Crow's Nest	3	27	ditto
P. Young	Talgai West, Ellinthorp	11	60	ditto
McFarlane Bros. ..	Kilbirnie Stud Farm, Radford	4	37	ditto
SHORTHORN.				
C. E. McDougall ..	Lyndhurst, Warwick	25	50	Entered or eligible Q.H.B.
W. B. Slade	East Glengallan, Warwick	77	283	Queensland Shorthorn Herd Book
W. T. Scrymgeour ..	"Tara," Arthur st., Toowoomba	79	300	ditto
T. B. Murray-Prior ..	Maroon, Boonah ..	..	17	Queensland Shorthorn Herd Book
T. B. Murray-Prior ..	Maroon, Boonah ..	2	20	Australian Herd Book

Name of Owner.	Address.	Number of Males.	Number of Females.	Herd Book.
	HEREFORD.			
H. F. Elwyn	Gunyan, Inglewood	250	750	Australian Hereford Herd Book
Mrs. Lumley Hill ..	Bellevue	45	127	Entered or eligible for entry A.H.H.B.
James T. Turner ..	The Holmwood, Neurum	25	50	Australian Hereford Herd Book
A. J. McConnel ..	Dugandan, Boonah	43	60	ditto
	ABERDEEN ANGUS.			
G. C. Clark	East Talgai, Ellinthorp	4	10	Entered or eligible for N.Z.H.B.
	SUSSEX.			
James T. Turner ..	The Holmwood, Neurum	2	4	Sussex Herd Book

ELEPHANT GRASS.

We have received from Mr. W. Brotherton, Gladstone, the accompanying excellent photograph of his crop of Elephant grass. Dairymen and stock-raisers, he says, need not fear any loss of stock through drought if they would only plant this prolific fodder plant. We have had, a little while since, inquiries as to where seed or plants of Elephant grass can be obtained. Mr. Brotherton can supply both.

A "MILK IMPROVER."

Mr. William Lawton, secretary of the Society of Medical Officers of Health (England), claims to have invented a "milk improver," which he claims will convert a pint of milk, costing 3d., into a quart for the cost of another penny. At a demonstration Mr. Lawton described his "milk improver" as a synthetic powder extracted from grass and herbs and ordinary cattle food. To make a quart of "milk," Mr. Lawton mixes 2 drachms of the powder into a thin paste with cold water, pours over it a pint of boiling water, and boils the whole for five or six minutes. A pint of cow's milk is then added, and the mixture again brought to

PLATE II.—ELEPHANT GRASS ON MR. W. BROTHERTON'S FARM, GLADSTONE.

the boil, strained, and allowed to cool, when it is ready for use. The result is a quart of liquid unrecognisable in taste from ordinary milk. Mr. Lawton claims that his "milk" is richer than cow's milk; and when a jugful was compared with the same amount of pure milk, it was found that a greater coating of cream was on the top of the mixture.

"My aim in composing the milk substitute," said Mr. Lawton to a Press representative, "is to help the housewives of England. In fact, the women worried me into doing it. The 'milk improver' is being made under my supervision by a big firm of chemical mixers, and it will be supplied to members of the Brittania League of Housewives in 2-drachm packets. The 4,000 members of the league are testing the milk substitute, a week's supply of which will be provided at cost price on the receipt of an undertaking to reduce the daily milk supply by one-half, and make up the quantity with my powder."—"New Zealand Farmer."

THE JERSEY-HEREFORD COW.

In April, 1910, we gave an illustration of Mr. Munro Hull's Jersey-Hereford cow "Spot" (*Q.A.J.*, Vol. xxiv., part 4), whose dam, "Brownie," was a Hereford, and the sire was a Jersey. Mr. Hull bred thirteen calves from "Brownie," only two of which were heifers. The idea of the cross was to introduce stamina to a Jersey strain. The late Mr. P. R. Gordon expressed the opinion that the cross would be unsuitable for dairy purposes. It will be of interest to many of our readers to note the results which we have received from Mr. Hull.

The cow "Spot" referred to was born in 1904, and died during the drought of 1915, leaving behind five daughters, five grand-daughters, and one great-granddaughter. She had ten calves—six born in the month of May, two in April, and two in June—a fairly regular record, not missing once from 1906 to 1915. "Spot's" test was 4·00, and her record 4 gallons for the day. None of her heifers test below 4, and one goes 5·1—all equally good milkers.

With one exception, none of her descendants show more than faint traces of Hereford. One is "bally," and the others carry either a white speck or a "boomerang" in white over the eyebrow; the body colour a uniform yellow. Temperament, wholly Jersey. "Spot" had five bull calves, and out of fifteen grandchildren born to date, ten are bulls. Is this a Hereford peculiarity?* "Spot's" eldest daughter has calved yearly since 1909. Her second daughter missed once (1915) since 1911. Her third calved in 1915, and was dried off in February last.

As regards stamina, not a single beast out of the twenty-six head bred from this cow and her progeny died from disease.

*No.—Ed. "*Q.A.J.*."

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, FEBRUARY 28 TO MARCH 31, 1917.

Four thousand five hundred and forty eggs were laid during the period from 28th February to 31st March. This concludes the competition. The prizes for the highest aggregate are won by the following:—First—Miss M. Hinze, 1,542 eggs; second—T. Fanning, 1,530 eggs; third—J. Zahl, 1,516 eggs. The following are winners in the single hen competition:—Dixie Egg Plant, 291 eggs; Miss Hinze, 289 eggs; while J. M. Manson (2 hens) and Mrs. Jobling divide the third prize with 276 eggs each. Mr. Manson wins the monthy prize with 132 eggs. A full report on the whole of the competition will be issued later. The following are the individual records:—

Competitors.	Breed.	March.	Total.
*Miss M. Hinze	White Leghorns	124	1,542
*T. Fanning	Do.	113	1,530
*J. Zahl	Do.	110	1,516
*J. Manson	Do.	132	1,500
*A. T. Coomber	Do.	88	1,475
J. R. Wilson	Do.	70	1,462
Geo. Tomlinson	Do.	64	1,440
G. H. Turner	Do.	68	1,438
W. Meneely	Do.	34	1,418
*E. A. Smith	Do.	88	1,410
*J. H. Gill, Victoria	Do.	126	1,395
*A. E. Walters	Do.	73	1,387
A. Howe, N.S.W.	Do.	69	1,386
*W. H. Knowles, junr.	Do.	104	1,380
Mrs. J. R. D. Munro	Do.	83	1,372
J. M. Manson	Black Orpingtons	87	1,366
Dr. E. C. Jennings	White Leghorns	45	1,362
*Dixie Egg Plant	Do.	106	1,354
*J. F. Dalrymple, N.S.W.	Rhode Island Reds	104	1,344
A. W. Bailey	White Leghorns	64	1,342
Geo. Prince	Do.	76	1,337
*E. F. Dennis	Do.	49	1,319
A. H. Padman, S.A.	Do.	66	1,314
H. W. Broad	Do.	62	1,313
Cowan Bros., N.S.W.	Do.	57	1,304
Mrs. W. D. Bradburne, N.S.W.	Do.	31	1,297
R. Burns	S. L. Wyandottes	84	1,291
*Mrs. J. H. Jobling, N.S.W.	Black Orpingtons	64	1,288
E. Peacock	White Leghorns	55	1,286
W. Purvis, S.A.	Do.	72	1,284
F. Clayton, N.S.W.	Do.	47	1,281
E. F. Dennis	Black Orpingtons	71	1,280
T. Taylor	White Leghorns	28	1,275
W. Lyell	Do.	45	1,274
*E. West	Do.	73	1,270
*C. Knoblauch	Do.	53	1,267
T. E. Jarman, N.S.W.	Do.	37	1,261
T. Fanning	Black Orpingtons	65	1,258
T. B. Hawkins	White Leghorns	37	1,261
King and Watson, N.S.W.	Do.	61	1,256
P. Brodie	Do.	45	1,255
A. F. Camkin, N.S.W.	Do.	55	1,251

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	March	Total.
Cowan Bros., N.S.W.	Black Orpingtons ...	75	1,242
G. W. Holland	White Leghorns ...	57	1,240
H. Jobling, N.S.W.	Black Orpingtons ..	47	1,232
Mars Poultry Farm	Black Orpingtons ...	74	1,225
Kelvin Poultry Farm	White Leghorns ...	23	1,225
Mars Poultry Farm	Do.	36	1,221
J. Anderson, Victoria	Do.	44	1,215
*W. L. Forrest, N.S.W....	Do.	68	1,213
W. Becker...	Do.	43	1,203
H. Hammill, N.S.W.	Do.	96	1,202
W. Hirst, N.S.W.	Do.	34	1,186
Mrs C. Davis	Do.	21	1,174
Moritz Bros., S.A.	Do.	71	1,163
J. G. Richter	Do.	27	1,159
*Kelvin Poultry Farm	Do.	46	1,153
*J. H. Madrers, N.S.W.	Rhode Island Reds ...	53	1,153
*J. W. Macrae	Black Orpingtons ...	68	1,143
F. Clayton, N.S.W.	Rhode Island Reds ...	50	1,141
C. P. Buchanan	White Leghorns ..	45	1,138
Harveston Poultry Farm	Do.	53	1,115
R. Burns	Black Orpingtons ...	34	1,115
S. B. Tutin	White Leghorns ...	14	1,090
J. Gosley	Do.	62	1,087
W. Lindus, N.S.W.	Do.	54	1,085
*J. Anderson, Victoria	Red Sussex	57	1,077
F. W. Leney	White Leghorns ...	37	1,063
A. T. Coomber	Sicilian Buttercups ...	74	1,059
L. K. Pettit, N.S.W.	White Leghorns ..	44	1,039
W. H Forsyth, N.S.W.	Black Orpingtons ...	51	999
E. F. Dennis	White Wyandottes ...	77	948
F. W Leney	Rhode Island Reds ...	19	915
Totals	...	4,540	91,861

* Indicates that the pen is taking part in single hen test.

RESULTS OF SINGLE HEN TEST.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
Miss M. Hinze	266	223	289	241	270	253	1,542
T. Fanning	275	206	272	261	227	229	1,520
J. Zahl	258	270	216	262	259	251	1,516
J. M. Manson	224	276	239	242	276	213	1,500
A. T. Coomber	263	271	213	231	231	236	1,475
E. A. Smith	255	269	239	265	199	183	1,410
J. H. Gill	214	237	238	267	212	227	1,395
W. H. Knowles, junr.	201	233	238	202	261	245	1,380
Dixie Egg Plant	291	269	265	269	...	260	1,354
J. F. Dalrymple	198	236	236	196	265	213	1,344
A. E. Walters	241	275	229	203	239	200	1,387
E. F. Dennis	270	237	184	265	233	200	1,319
Mrs. Jobling	211	276	197	202	194	208	1,288
E. West	234	235	206	205	189	201	1,270
C. Knoblauch	191	235	223	189	205	224	1,267
W. L. Forrest	240	237	62	185	255	234	1,213
Kelvin Poultry Farm	193	167	159	194	266	174	1,153
J. H. Madrers	150	223	224	215	165	176	1,153
J. W. Macrae	157	232	214	222	148	170	1,143
J. Anderson	202	166	232	114	196	167	1,077

General Notes.

WINTER CEREALS AT ROMA STATE FARM.

In the March issue of the Journal the number of rainfalls was given as "thirty-seven." This should have read "thirty-two." The correction reached us too late for publication.

WHAT A FOUR-MILLION ARMY MEANS.

In an address given in London a few months ago, Mr. Herbert N. Casson gave some idea of what a four-million army means. He said Britain's little army of 275,000 became 4,000,000 in such quick time that we could not count the men as they came in. Four million soldiers meant one soldier for every acre in Yorkshire, one for every two houses in Great Britain, and thirty-three for every square mile. We had now an army which, marching four abreast, would be 760 miles long. Let every man carry 500 sovereigns, and there we had the army and the cost—an army which would reach from Land's End to John o' Groats. We could stand our army round the coastline, elbows touching, and with every man bearing his own weight of silver we had the cost.

THE PROTECTION OF MIGRATORY BIRDS IN CANADA.

Many years ago, when agricultural settlement in Queensland was in its infancy, and dense scrubs, rivers, lakes, and plains were the homes of vast numbers of game birds, it was no uncommon sight to see thousands of wild ducks, black swans, geese, plain and scrub turkeys, quail, plover, pigeons, and hosts of useful insectivorous birds in all directions. The lakes at Noosa, particularly Lake Cootharaba, were the homes of countless water-fowl; the scrubs still standing on the banks of the Brisbane, Bremer, Albert, Logan, Burnett, and Northern rivers were alive with birds. In the Far North wild geese could be seen in great numbers; and Torres Strait pigeons darkened the air at certain seasons of the year. Everywhere, even in close vicinity to the coastal towns, game was plentiful. There was then, unfortunately, no Native Birds Protection Act in force; and as immigration increased the destruction of the scrubs and the settlement of hundreds of farmers on the rivers and lakes resulted in the indiscriminate destruction of not only game birds, but of the smaller insectivorous birds, the decrease in the numbers of the latter being the primary cause of the increasing number of insect pests in our agricultural districts, orchards, and gardens.

In the "Agricultural Gazette" of Canada of December, 1916, we are given "An Account of the International Treaty of 1916 between Great Britain and the United States for the Protection of Migratory

Birds in the United States and Canada," by C. Gordon Hewitt, D.Sc., Dominion Entomologist, who writes—

"For many years the numbers of our migratory birds, such as ducks, geese, insectivorous birds, and shore birds—which class includes the plovers, sandpipers, snipe, woodcock, &c.—have been decreasing. This decrease is a matter of common knowledge and observation throughout the Dominion. Certain of these migratory birds—such as the Eskimo plover, which formerly existed in enormous numbers and was killed for the market, the Labrador duck, the passenger pigeon, and the great auk—have now become extinct. Others—such as the whooping crane and the wood duck, the most beautiful of our native ducks—have become so reduced in numbers as to render their continued existence without further protection a matter of doubt.

"From a national standpoint the prospect of this continued decrease involved serious economic considerations. Leaving out of account the value from an æsthetic point of view of this portion of our Canadian wild life, great as that is, and regarding it as an economic asset to the country, we were faced with the gradual reduction of our migratory wildfowl, whose value as food and as means of securing recreation are inestimable, and of our insectivorous birds, which are of even greater importance to the welfare of our agricultural interests.

Insectivorous birds constitute one of the chief natural agencies controlling insect pests affecting field crops, orchards, and forests. In field crops alone the annual loss in Canada due to the depredations of insect pests is, on a conservative estimate, not less than 125,000,000 dollars. And, with the development of the country, the damage caused by insect pests is increasing, while the numbers of insectivorous birds have been decreasing.

"The chief causes of this decrease in the numbers of our migratory birds are as follows:—Canada constitutes the chief breeding-place for the greater number of these birds. With the settlement of the country the breeding-places of many species have been destroyed. The clearing of the land has involved the clearing of the nesting sites of insectivorous birds; the draining of marshy areas and the settlement of the prairies have driven wild-fowl from their former breeding and feeding places. Such causes are, therefore, unavoidable to a large extent. On the other hand, while many of the provinces have excellent laws governing the protection of game, non-game, and insectivorous birds, it has not always been possible to give these birds adequate protection. The increase in the number of persons who carry guns and the improvement of modern sporting guns have had their effect on the abundance of wild fowl.

"Even with the strictest enforcement of protective laws, Canadians would have been unable to prevent the continued decrease of migratory birds unless the requisite protection were given to such birds during the time that they are in United States territory. In other words, our migratory birds cannot be adequately protected from continued decrease without co-operative protection in Canada and the United States.

"It is a well-known fact that while some of the States of the Union had excellent laws, which they enforced, others failed to protect their birds. In some States the shooting of wild fowl in the spring was permitted; this involved the killing of birds, usually mated at that time of the year, on their way to their breeding-grounds in the North. This discouraged many Canadians, who naturally asked why they should protect their wild fowl for the market gunners in the South. The existence of such market gunners, who annually killed enormous quantities of Canadian-bred ducks and geese for the markets of the big cities in the United States, constituted one of the greatest causes of reduction and one of the chief obstacles to any rational attempt to prevent such reduction and to maintain our stock of wild fowl. Not only were game birds affected, but insectivorous birds were likewise killed by thousands during their winter sojourn in the South; this destruction has been particularly serious in the case of the robin, one of our important cutworm destroyers.

"As a result of the efforts of sportsmen, game protective associations, and other organisations interested in the conservation of the wild fowl and other migratory birds in the United States, the Federal Migratory Bird Law was enacted in 1913, for the purpose of securing more adequate protection for migratory birds which, by reason of their migratory habits, could not be successfully protected by the efforts of individual States so long as other States were derelict in the matter. The objects of the Federal regulations were:—To reduce the open seasons, which varied greatly in different States; to secure a more uniform open season, not exceeding three and a-half months, fixed in accordance with local conditions, so that the sportsmen would have shooting at the best time of the year; and to prevent the shooting of migratory birds in the spring. A close season for a period of years was given to certain birds, particularly shore birds, and the shooting of insectivorous birds was entirely forbidden. The majority of the States amended their laws to conform with the Federal Regulations, and although certain States, in which the influence of the market hunter and gunners with no thought of the future appeared to predominate, objected to Federal interference, the outcome of this increased protection and elimination of spring shooting has been a noticeable increase in the numbers of wild fowl. This increase has also been observed by Canadian sportsmen.

"The treaty was signed in Washington on 16th August, 1916, by His Majesty's Ambassador, Sir Cecil Spring-Rice, G.C.V.O., and the Secretary of State of the United States, Mr. Robert Lansing. On the unanimous vote of the Committee on Foreign Relations, it was ratified by the Senate of the United States on 29th August, 1916.

"Of the eight articles of the treaty, the most important provision is Article II., providing for:—(1) A close season on migratory game birds from 10th March to 1st September, with the exception given; (2) an open season of three and one-half months; and (3) a close season throughout the year on insectivorous birds. The open season of three and one-half months may be fixed anywhere between 1st September and 10th

March to suit the local conditions. The restriction of the open season on wild fowl to three and one-half months will involve in some provinces a shortening of the present open season, but, in view of the objects of the treaty and the experience that such restriction in the United States is increasing the supply of birds, this change will undoubtedly meet with the support of sportsmen desirous of preventing the continued decrease in the numbers of wild fowl.

"The conclusion of this convention constitutes the most important and far-reaching measure ever taken in the history of bird protection. Some years ago efforts were made to secure the international protection of birds in Europe; but, while the general movement towards better protection for insectivorous birds was thereby furthered, the requisite co-operation on the part of all the countries interested was hampered by inactivity on the part of some of the Governments and a considerable diversity of interests and opinion. Fortunately, many of these difficulties do not exist in North America, and in the United States and Canada there is an ever-growing sentiment in favour of preserving what is left of our former wealth of wild life, which has been so seriously depleted by improvidence in the past. This international measure will affect over one thousand species and subspecies of birds from the Gulf of Mexico to the North Pole, and we may confidently look forward to not merely a cessation of the decrease, but to an increase of our migratory birds, which are so valuable a national asset."

QUEENSLAND AGRICULTURAL JOURNAL—FEBRUARY, 1916.

Our thanks are due to the undermentioned subscribers for their response to our request for spare copies of the above issue of the Journal:—

C. F. Dennis, Hawthorne road, Bulimba.
H. Reese, Canberra Springs, Eukey, *viâ* Ballandean.
Subscriber, Flagstone Creek, *viâ* Helidon.
H. Crewther, Baking Board, Western Line.
A. Walls, Flagstone Creek, *viâ* Helidon.
Wm. E. Stacey, Allambie Farm, Mount Perry,
"Cardwell" (anonymous).

JELLY MADE FROM COTTON BOLLS.

A lady in Florida, U.S.A., has sent to the Commissioner for Agriculture at Tallahassee samples of jelly made from cotton bolls and buds. It is well flavoured, and resembles somewhat in colour and taste jelly made from guavas.—"Cotton and Cotton Oil News."

[With cotton at 20 cents (10d.) per lb., we are inclined to think that it would pay better to let the cotton mature and utilise the waste for the manufacture of high explosives.—Ed. "*Q.A.J.*"]

A FINE CROP OF RHODES GRASS.

Mrs. J. Adams, of Henley Park, Yalleroi, sends us a photograph and description of Rhodes grass grown on her grazing farm at Henley Park, Yalleroi. Planted last spring, it is now over 5 ft. high and just shedding its seeds (16th March). The grass was planted according to the manner advocated in the *Queensland Agricultural Journal*—viz., scattering the seeds in ashes—and proved a great success. At the time of writing it was throwing out runners, and rapidly travelling over the ground during the wet weather. The photograph shows what can be done in the way of growing artificial grasses in the Yalleroi district on the so-called desert country, where the summer heat is intense. Yalleroi is 348 miles west of Rockhampton. We regret that the halation on the lower half of the photograph will not admit of its being reproduced in the Journal.

QUEENSLAND SHOW DATES FOR 1917.

We have received from Mr. J. Bain, hon. secretary of the Queensland Chamber of Agricultural Societies, the following list of Queensland show dates for 1917 allotted by the Chamber:—

Goombungee A.H. and P. Society (J. J. Morgan, secretary), 7th March.

Chinchilla A. and P. Association (W. L. Archer, secretary), 10th and 11th April.

Toowoomba—Royal Agricultural Society of Queensland (G. Noble, secretary), 24th to 26th April.

Esk—Toogoolawah P.A. and I. Association (T. C. Pryde, secretary), 1st and 2nd May,

Pomona—Noosa A.H. and I. Society (H. Robinson, secretary), 2nd and 3rd May.

Nanango A.P. and M. Society (S. Cavaye, secretary), 2nd and 3rd May.

Charleville—Central Warrego P. and A. Association (T. C. Fallis, secretary), 8th and 9th May.

Lowood and Tarampa P. and A. Association (W. E. Michel, secretary), 9th and 10th May.

Kingaroy A.P. and I. Society (R. A. Pearse, secretary), 9th and 10th May.

Springsure P. and A. Society (W. Fisher, secretary), 9th and 10th May.

Mitchell—Maranoa P.A. and I. Association (T. E. Shannon, secretary), 15th and 16th May.

Wondai A.P. and I. Society (H. J. Compagnoni, secretary), 16th and 17th May.

Boonah—Fassifern A. and P. Association (J. McKenzie, secretary), 16th and 17th May.

Roma—Western P. and A. Association of Queensland (H. M. Campbell, secretary), 22nd and 23rd May.

Mackay—Pioneer River Farmers and Graziers' Show Association (Frank Black, secretary), 22nd and 23rd May.

Ipswich—Queensland P. and A. Society (G. W. Allen, secretary), 23rd and 24th May.

Kilkivan P.A. and I. Association (M. O. Aronsten, secretary), 23rd and 24th May.

Maryborough—Wide Bay and Burnett P. and A. Society (H. A. Jones, secretary), 29th to 31st May.

Beaudesert—Logan and Albert A. and P. Society (M. Selwyn Smith, secretary), 30th May.

Marburg A. and I. Association (F. H. Bielefeld, secretary), 2nd and 4th June.

Gayndah P.I.A. and H. Society (E. M. Stephensen, secretary), 5th and 6th June.

North Pine—The Pine River A.H. and I. Association (G. Armstrong, secretary), 8th and 9th June.

Woombye—North Coast A. and H. Society (E. E. McNall, secretary), 6th and 7th June.

Gin Gin A.P. and I. Society (Chas. M. Morris, secretary), 13th and 14th June.

Rockhampton Agricultural Society (H. Hill, secretary), 21st to 23rd June.

Nambour—Maroochy P.A.H. and I. Society (J. J. Wilkinson, secretary), 4th and 5th July.

Lockyer A. and I. Society (F. Roberts, secretary), 4th and 5th July.

Biggenden A. and P. Society (C. J. Stephenson, secretary), 5th and 6th July.

Crow's Nest A.H. and I. Society (W. B. Carlile, secretary), 10th and 11th July.

Charters Towers—Towers P.A. and M. Association (A. H. Pritchard, secretary), 10th and 11th July.

Kilcoy P.A. and I. Society (H. G. Fien, secretary), 12th and 13th July.

Barcaldine P.A. and H. Society (W. J. R. Chambers, secretary), 24th and 25th July.

Rosewood A. and H. Association (A. J. Loveday, secretary), 25th and 26th July.

Woodford A.P. and I. Association (G. H. Osmond, secretary), 26th and 27th July.

Dalby P. and A. Association (James Hunter, secretary), 1st and 2nd August.

Caboolture P.A. and I. Society (C. V. Hemming, secretary), 2nd and 3rd August.

Brisbane—National A. and I. Association of Queensland (J. Bain, secretary), 13th to 18th August.

Gympie A.M. and P. Society (F. W. Shepherd, secretary), 29th and 30th August.

Bundaberg A.P. and I. Society (Redmond Bros., secretaries), 6th and 7th September.

Clifton—Darling Downs P.A. and I. Association (P. G. A. Murphy, secretary), 12th and 13th September.

Zillmere A.H. and I. Society (A. B. Marquis, secretary), 22nd September.

Beenleigh—A. and P. Society of Southern Queensland (R. Newburn, secretary), 27th and 28th September.

Mt. Gravatt—Mt. Gravatt and District A. H. and I. Society (H. Trim, hon. secretary), 8th September.

Cleveland—Cleveland A. H. and I. Society (E. Lewis, hon. secretary).

Coorparoo—Coorparoo Horticultural and Industrial Progress Association (W. D. Dell, hon. secretary), 1st September.

Mackay—Pioneer River Farmers and Graziers' Association (P. T. Dunworth, secretary).

Ingham—Herbert River P. and A. Association (R. L. Jones, secretary), 31st August and 1st September.

Wellington Point—Wellington Point A. H. and I. Association (R. C. Flitcroft, secretary), 24th November.

Mundowran—Mundowran Pocket Farmers' Association (A. J. C. Mathieson, secretary).

Oakey Creek, *viâ* Eumundi—Kenilworth Farmers' Association (G. B. Sutton, Secretary).

Answers to Correspondents.

GEOLOGIST, Cairns—

Your question as to the origin of the Stassfurt potash deposits, and your suggestion that similar deposits might exist in some portion of Queensland, involve a lengthy explanation. Some time ago we received the following paper from an unknown correspondent, who did not, however, state the source of his information:—

THE ORIGIN AND GEOLOGICAL FORMATION OF THE STASSFURT POTASH DEPOSITS.

The Stassfurt salt and potash deposits, according to the generally accepted theory of Herr Lierke, the agricultural chemist to the "Verkaufs-Syndicat der Kalkwerke," originated as follows:—These deposits had their origin thousands of years ago in a sea or ocean, the waters of which gradually receded, leaving, near the coast, lakes which still retained communication with the great ocean by means of small channels. In that part of Europe the climate was then tropical, and the waters of these lakes rapidly evaporated, but were constantly replenished through small channels connecting them with the main body. Decade after decade this continued until, by evaporation and crystallisation, the various salts present in the sea water were deposited in solid form. The less soluble material, such as sulphate of lime or anhydrite, solidified first, and formed the lowest stratum. Then came common rock-salt with a slowly thickening layer, which ultimately reached 3,000 ft., and is estimated to have been 13,000 years in formation. This rock-salt (slow formation) is interspersed with lamellar deposits of anhydrite, which gradually diminish toward the top, and are finally replaced by mineral polyhalite, which is composed of sulphate of lime, sulphate of potash, and sulphate of magnesia. The situation in which the polyhalite predominates is called the "Polyhalite Region," and after it comes the "Kieserit Region," in which, between the rock-salt strata, kieserit (sulphate of magnesia) is embedded. Above the kieserit lies the potash region, consisting mainly of carnallit, a mineral compound of muriate of potash and chloride of magnesia. The carnallit deposit is from 50 to 130 ft. thick, and yields the most important of the crude potash salts, and that from which are manufactured most of the concentrated articles, including muriate of potash. Overlying this potash region is a layer of impervious salt-clay, which acts as a watertight roof to protect and preserve the very soluble potash and magnesia salts which, had it not been for the protection of this overlying stratum, would have been long ages ago washed away and lost by the action of the water percolating from above. Above this salt-clay roof is a stratum of varying thickness of anhydrite (sulphate of lime), and, still above this, a second deposit of rock-salt (later formation), probably formed under more recent

climatic and atmospheric influences, or possibly by chemical changes in dissolving, and subsequent precipitation. The salt deposit contains 98 per cent. (or often more) of pure salt—a degree of purity rarely elsewhere found. Finally, above this are strata of gypsum, tenaceous clay, sandstone, and limestone, which crop out at the surface. At some few places, through cracks and fissures, surface water has entered and either entirely carried away the potash deposits or changed them into secondary products. Resulting from this later action are beds of kainit, sylvinit, and other less important compounds in the upper strata.

This is the generally accepted theory as to the origin and formation of these deposits, which are found so plentifully in the vicinity of the Hartz Mountains, in Germany, and nowhere else in the world, so far as is known; and the fact remains that the potash salt deposits of the Stassfurt mines are so enormous as to be practically inexhaustible.

THE DISCOVERY OF THE POTASH DEPOSITS IN GERMANY.

In the year 1839 the Prussian Government commenced the sinking of a shaft for the purpose of mining rock-salt. In 1851 a peculiar layer of saline compounds was met with at a depth of 1,066 ft. These deposits were of great chemical value; and Mr. H. Rose, an analytical chemist, directed attention to the salt as a source for potash compounds. Acting on his suggestion, the Governments of Prussia and Saxony exploited these deposits, with the result that the potash, up to that time derived from wood ashes, seaweed, &c., was replaced by the newly discovered mineral compounds. The mines were energetically worked, and crude material extracted to the amount of 40,000 cwt. per day. Since then the Stassfurt mines have supplied the agricultural world with the potash so much needed in agriculture.

HOW THE POTASH IS OBTAINED.

Of the crude salts in the mines, carnallit is the one that occurs in greatest quantity. Seams of pure carnallit, consisting of muriate of potash and chloride of magnesia, are occasionally met with; but, generally, the vast deposits of carnallit are interspersed with seams of rock-salt and kieserit. It is generally used in the manufacturing establishments connected with the mines for the manufacture of muriate of potash. In this process it is first roughly ground and placed in pans where it is treated with chloride of magnesia liquor, and steam is passed through it to assist in dissolving it. In this way the muriate is dissolved out, and the solution is run into large iron crystallising tanks, where it is allowed to cool for three or four days, and a muriate of potash of 60 to 75 per cent. purity crystallises out. Various measures of treatment, including washing with cold water to remove the common salt and chloride of magnesia, are further resorted to, and the product is a muriate of potash varying from 70 to 99 per cent. purity, according to the process adopted. This muriate will analyse from 44 to 56 per cent. of pure potash.

When we consider the geological conditions as above stated under which the Stassfurt salt and potash deposits were formed, the question arises whether similar conditions exist in any portion of Australia. In the Hartz region, in Germany, it appears that these deposits had their

origin in what was, thousands of years ago, the tropical region of Europe. They originated in a sea or an ocean, which gradually receded, leaving lakes, the waters of which rapidly evaporated, but were always replenished through small channels connecting them with the ocean. In the centuries the salts present in the seawater were deposited in solid form.

In South Australia there are numerous and extensive salt lakes and lagoons—some near the coast, others inland—the principal ones being Lakes Eyre, North and South, Torrens, Gairdner, Frome, and Blanche. These and others are mainly large expanses of mud, and occupy low-lying portions of the plain country. Various bores have been put down to considerable depths up to 4,000 ft. in different parts. We cannot say with what result. The fact that most of the known minerals are found in different parts of Australia gives rise to the idea that there may be areas where potash deposits may exist.

DERIVATION OF THE WORD "SILO."

"CURIOUS," Julia Creek—

The derivation of the word "silo" was given in this Journal in April, 1911; but as you may not have a copy of that date, we give you the information you ask for:—

The silo itself means a very great deal to the dairy farmer, since by its help he can tide his stock over several months of scarcity of feed. But it seems that J.S., our correspondent, wants to know the meaning of the word—the derivation of it. Here it is. The word silo came from the Greek *siros*—a pit or hole sunk in the ground for keeping corn in. Then *siros* became Latinised into *sirus*, and in its turn *sirus* in Spanish and French was corrupted into *silos*, or, as is found in old books in those languages, *silo;* and in Spanish there is the verb *ensilor*, which signifies the putting of corn into a silo; and the French writers gave the term "ensilage" to the material thus stored away. The father of modern ensilage, M. Goffart, was practically the first to use it. As to silos and ensilage being modern inventions, it is, on the contrary, as old as the Pharaohs, and possibly Noah fed his stock in the Ark on compressed ensilage. The old naturalist, Pliny, mentions it as being known in Thrace and Cappadocia. The Roman generals in Africa and Spain (he says) dug holes in dry ground, spread chaff or stubble underneath, and laid up grain in the ear in them. Most of the Greek authors—Euripides, Theophrastus, Hesychius, and Suidas—speak of the siros or silo.

Amongst the Eastern nations ensilage has been largely used. In Barbary often 200 or 300 silos have been found together, the smallest holding 400 bushels. In Egypt a similar method has been in vogue for ages. Colonel Burnaby, in his "Ride to Khiva," and Mr. O'Donovan, in "The Merv Oasis," both refer to the subject. The colonel tells how he met a party of men and women near Khiva, who were engaged in unearthing a quantity of grass from a deep cutting in the ground. This grass had been mown the previous autumn, and was thus preserved until such time as the owner required it; the grass was as fresh as the day it was cut. It is remarkable that the Kafir word for a grain pit is *essisile*, which seems to have affinity with silo. The South Sea Islanders have long practised the ensilage of breadfruit, taro, yams, &c. The Mexicans knew all about silos centuries ago. But we could write a whole book on the subject. This will probably suffice; *but will it suffice to induce some of our farmers to rise to the wisdom of our savage ancestors and build silos?*

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR MARCH, 1917.

Article.		MARCH. Prices.
Bacon	lb.	9d. to 1s.
Barley	bush.	4s. 3d.
Bran	ton	£4 17s. 6d.
Broom Millet	,,	£22 to £24
Butter	cwt.	149s. 4d.
Chaff, Mixed	ton	£3 15s. to £4
Chaff, Oaten	,,	£5 to £5 10s.
Chaff, Lucerne	,,	£3 5s. to £3 15s.
Chaff, Wheaten	,,	£4 10s.
Cheese	lb.	9½d.
Flour	ton	£12
Hams	lb.	1s. 3d. to 1s. 4d.
Hay, Oaten	ton	£4 10s.
Hay, Lucerne	,,	£1 10s. to £2 5s.
Honey	lb.	3¾d. to 4d.
Maize	bush.	2s. 6d. to 2s. 7d.
Oats	,,	3s. to 4s.
Onions	ton	£7 10s. to £9 10s.
Peanuts	lb.	2d. to 3d.
Pollard	ton	£6 12s. 6d.
Potatoes	,,	£4 5s. to £7
Potatoes (Sweet)	sug. bag	1s. to 1s. 3d.
Pumpkins (Cattle)	ton	£2 10s to £2 15s.
Eggs	doz.	1s. 2d. to 1s. 10d.
Fowls	pair	2s. 9d. to 5s.
Ducks, English	,,	3s. 6d. to 4s.
Ducks, Muscovy	,,	5s. 6d. to 7s. 6d.
Geese	,,	7s. to 9s 6d.
Turkeys (Hens)	,,	9s to 12s. 6d.
Turkeys (Gobblers)	,,	18s. to 25s.
Wheat	bush.	3s. to 3s. 6d.

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per bundle	...
Cabbages, per dozen	2s. to 8s.
Cauliflowers, per dozen	...
Celery, per bundle	...
Cucumbers, per dozen	3d. to 1s.
Beans, per sugar bag	1s. to 3s. 3d.
Peas, per sugar bag	4s. to 7s. 6d.
Carrots, per dozen bunches	10d. to 1s.
Chocos, per half-case	...
Beetroot, per dozen bunches	...
Marrows, per dozen	1s. 6d. to 4s.
Lettuce, per dozen	1s. to 2s.
Parsnips, per bundle	6d.
Sweet Potatoes, per sugar bag	2s. to 2s. 6d.
Table Pumpkins, per dozen	2s. to 4s
Tomatoes, per quarter-case	1s. 6d. to 3s.
Vegetable Marrows, per dozen	...
Turnips, per dozen bunches	10d. to 1s.
Rhubarb, per dozen bundles	1s.

SOUTHERN FRUIT MARKETS.

Article.	MARCH. Prices.
Bananas (Queensland), per case	7s. to 9s.
Bananas (Fiji), per case	16s. to 17s. 6d.
Bananas (G.M.), per case	18s. to 19s.
Custard Apples, per tray	..
Lemons (Local), per bushel-case	2s. to 5s.
Mandarins, per case	...
Mangoes, per bushel-case	...
Oranges (Navel), per case	17s. to 19s.
Oranges (other), per case	...
Pears, per case	...
Papaw Apples, per double-case	7s. to 9s.
Passion Fruit, per half-bushel-case	3s. to 6s.
Persimmons, per half-case	...
Pineapples (Queens), per double-case	5s. to 7s.
Pineapples (Ripleys), per double-case	4s. to 6s.
Pineapples (Common) per double-case	4s. to 6s.
Strawberries (Local), per dozen punnets*	...
Tomatoes, per half-bushel-case	1s. 4d. to 3s.
Granadillas, per double case	18s. to 20s.

* 1 punnet = 1 quart.

PRICES OF FRUIT—TURBOT STREET MARKETS.

Article.	MARCH. Prices.
Apples, Eating, per case	6s. to 11s.
Apples, Cooking, per case	5s. 6d. to 7s. 6d.
Bananas (Cavendish), per dozen	1d. to 3½d.
Bananas (Sugar), per dozen	1d. to 3d.
Citrons, per hundredweight	10s.
Cocoanuts, per sack	12s. to 15s.
Cumquats, per quarter-case	3s. 6d. to 4s. 9d.
Custard Apples, per quarter-case	...
Granadillas, per quarter-case	...
Grapes, per lb.	2d to 4d.
Lemons (Lisbon), per quarter-case	3s. to 4s. 6d.
Limes, per quarter-case	3s. to 4s 6d.
Nectarines, per case	1s. to 3s.
Oranges (Navel), per case	9s. to 10s.
Oranges (other), per case	4s. to 8s.
Papaw Apples, per quarter-case	2s. to 3s. 6d.
Passion Fruit, per quarter-case	3s. to 4s.
Peaches, per quarter-case	1s. 3d. to 3s. 6d.
Pears, per case	2s. to 3s.
Peanuts, per lb.	2d. to 3d.
Persimmons, per quarter-case	2s. to 4s.
Plums, per quarter-case	4s. to 5s.
Plums (prime eating), per case	..
Pineapples (Ripleys), per dozen	1s. to 2s. 6d.
Pineapples (Rough), per dozen	4d. to 1s. 3d.
Pineapples (Smooth), per dozen	6d. to 2s. 6d.
Quinces, per quarter-case	3s
Tomatoes, per quarter-case	1s. 6d. to 3s.
Watermelons, per dozen	2s. 6d. to 7s.

TOP PRICES, ENOGGERA YARDS, FEBRUARY, 1917.

Animal.	FEBRUARY. Prices.
Bullocks	£18 7s. 6d. to £23
Bullocks (Single)	...
Cows	£12 5s. to £13 15s.
Merino Wethers	34s. 9d.
Crossbred Wethers	35s. 6d.
Merino Ewes	30s. 3d.
Crossbred Ewes	32s. 3d.
Lambs	36s.
Pigs (Porkers)	...

ASTRONOMICAL DATA FOR QUEENSLAND.

TIMES COMPUTED BY D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET AT BRISBANE AND THE PHASES OF THE MOON

On account of the alteration of Civil (Clock) Time which took place on 1st January, it is necessary to *add one hour* to all the times given on this page till the last Sunday in March.

1917.	JANUARY.		FEBRUARY.		MARCH.		APRIL.	
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.
1	4·57	6·46	5·21	6·41	5·41	6·19	5·58	5·46
2	4·58	6·46	5·22	6·41	5·41	6·18	5·59	5·45
3	4·59	6·46	5·23	6·40	5·42	6·17	5·59	5·44
4	4·59	6·46	5·24	6·40	5·43	6·16	6·0	5·43
5	5·0	6·46	5·25	6·39	5·44	6·15	6·0	5·42
6	5·1	6·47	5·25	6·39	5·45	6·14	6·1	5·41
7	5·2	6·47	5·26	6·38	5·45	6·13	6·1	5·39
8	5·3	6·47	5·27	6·37	5·46	6·12	6·2	5·38
9	5·3	6·47	5·28	6·36	5·46	6·11	6·2	5·37
10	5·4	6·48	5·29	6·35	5·47	6·10	6·3	5·36
11	5·5	6·48	5·29	6·35	5·47	6·9	6·3	5·35
12	5·6	6·47	5·30	6·34	5·48	6·8	6·4	5·34
13	5·6	6·47	5·31	6·33	5·48	6·7	6·4	5·33
14	5·7	6·47	5·32	6·32	5·49	6·6	6·5	5·32
15	5·8	6·47	5·32	6·32	5·49	6·5	6·5	5·31
16	5·9	6·47	5·33	6·31	5·50	6·3	6·6	5·30
17	5·9	6·47	5·34	6·30	5·50	6·2	6·6	5·29
18	5·10	6·47	5·35	6·29	5·51	6·1	6·7	5·28
19	5·11	6·47	5·35	6·28	5·51	6·0	6·7	5·27
20	5·12	6·46	5·36	6·28	5·52	5·59	6·8	5·26
21	5·13	6·46	5·37	6·27	5·52	5·58	6·8	5·25
22	5·13	6·46	5·37	6·26	5·53	5·57	6·8	5·24
23	5·14	6·45	5·38	6·25	5·53	5·56	6·9	5·23
24	5·15	6·45	5·38	6·24	5·54	5·55	6·9	5·23
25	5·16	6·45	5·39	6·23	5·54	5·54	6·10	5·22
26	5·16	6·44	5·39	6·22	5·55	5·52	6·10	5·21
27	5·17	6·44	5·40	6·21	5·55	5·51	6·11	5·20
28	5·18	6·43	5·40	6·20	5·56	5·50	6·11	5·19
29	5·19	6·43	...	...	5·57	5·49	6·12	5·18
30	5·19	6·42	...	...	5·57	5·48	6·12	5·18
31	5·20	6·42	...	..	5·58	5·47	...	...

The Phases of the Moon commence at the times stated in Queensland, New South Wales, and Victoria only.

		H. M.
8 Jan.,	○ Full Moon	5 42 p.m.
16 ,,	☽ Last Quarter	9 42 ,,
23 ,,	● New Moon	5 40 ,,
30 ,,	☾ First Quarter	11 1 a.m.

There will be a total eclipse of the moon on 8th Jan before it rises in Queensland, but the moon will still be partly in the shadow of the earth for about three-quarters of an hour after it becomes visible. It will be farthest from the earth on the 9th January, and nearest on the 23rd.

7 Feb.,	○ Full Moon	1 28 p.m.
15 ,,	☽ Last Quarter	11 53 a.m.
22 ,,	● New Moon	4 9 ,,

It will be farthest from the earth on the 6th Feb., and nearest on the 21st.

1 Mar.	☾ First Quarter	2 43 a.m.
9 ,,	○ Full Moon	7 58 ,,
16 ,,	☽ Last Quarter	10 33 p.m.
23 ,,	● New Moon	2 5 ,,
30 ,,	☾ First Quarter	8 36 ,,

It will be farthest from the earth on the 5th about midnight, and nearest on the 21st about 7 p.m

7 Apr.	○ Full Moon	11 49 p.m.
15 ,,	☽ Last Quarter	6 12 a.m.
22 ,,	● New Moon	12 1 ,,
29 ,,	☾ First Quarter	3 22 p.m.

It will be farthest from the earth on the 2nd and on the 30th, and nearest on the 18th.

Statistics.

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF FEBRUARY IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING FEBRUARY, 1917 AND 1916, FOR COMPARISON.

Divisions and Stations.	Average Rainfall.		Total Rainfall.		Divisions and Stations.	Average Rainfall.		Total Rainfall.	
	Feb.	No. of Years' Records.	Feb., 1917.	Feb., 1916.		Feb.	No. of Years' Records.	Feb., 1917.	Feb., 1916.
North Coast.	In.		In.	In.	*South Coast*—continued:	In.		In.	In.
Atherton	9·83	15	9·83	7·06					
Cairns	15·41	34	6·09	7·34	Nambour	9·40	20	5·58	3·57
Cardwell	17·13	44	22·09	6·33	Nanango	4·69	34	1·68	2·21
Cooktown	13·87	40	11·57	4·97	Rockhampton ...	8·15	29	5·46	0·73
Herberton	7·37	29	7·79	10·48	Woodford	9·80	29	3·02	1·91
Ingham	15·51	24	23·93	10·86					
Innisfail	22·44	35	19·20	11·85	*Darling Downs.*				
Mossman	11·48	4	17·95	5·33					
Townsville	12·08	45	20·06	7·54	Dalby	2·94	46	3·45	4·45
					Emu Vale	2·27	20	2·73	5·78
Central Coast.					Jimbour	3·14	28	1·68	2·24
					Miles	2·69	31	4·12	3·30
Ayr	9·47	29	10·49	7·49	Stanthorpe ...	3·40	43	4·29	4·98
Bowen	8·76	45	12·04	6·85	Toowoomba ...	4·55	44	6·85	3·39
Charters Towers ...	4·19	34	7·45	8·78	Warwick	3·03	29	2·57	4·24
Mackay	11·78	45	18·49	4·92					
Proserpine	10·94	13	14·15	8·00					
St. Lawrence ...	8·34	45	10·58	2·19	*Maranoa.*				
					Roma	3·18	42	4·88	1·22
South Coast.									
					State Farms, &c.				
Biggenden	3·92	17	2·93	4·06					
Bundaberg	6·43	33	8·46	5·07					
Brisbane	6·63	66	1·64	15·21	Bungeworgorai ...	3·02	4	4·43	1·40
Childers	6·03	21	6·73	8·54	Gatton College ...	3·27	17	4·01	2·26
Crohamhurst ...	15·03	25	6·97	1·78	Gindie	2·68	17	6·17	0·48
Esk	6·09	29	3·89	6·15	Hermitage ...	2·33	10	2·83	4·55
Gayndah	4·29	45	3·11	3·65	Kairi	6·18	4	8·99	4·83
Gympie	6·91	46	2·84	3·19	Kumerunga ...	14·62	26	7·41	7·04
Glasshouse M'tains	11·07	8	3·90	2·55	Sugar Experiment				
Kilkivan	5·36	37	2·33	2·65	Station, Mackay	10·35	19	14·80	6·42
Maryborough ...	6·74	45	6·28	7·44	Warren	3·92	4	7·25	2·08

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for February this year and for the same period of 1916, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND,
Divisional Officer.

Farm and Garden Notes for May.

Field.—During this month, the principal work in the field will be the sowing of wheat, barley, oats, rye, and vetches. There is no time to lose now at this work. Potatoes should be hilled up. Cut tobacco. The last of the cotton crop should now be picked, the bushes being stripped daily after the dew has evaporated. Cotton-growers are notified that cotton-ginning and baling machinery has been installed on the premises of the Department of Agriculture and Stock in William street, where seed cotton will be received by the department from the growers, to whom an advance of 1¾d. per lb. will be paid. The cotton will then be ginned, baled, and marketed in the best market, and whatever balance to credit is shown when account sales are received will be distributed amongst the suppliers according to the amount of cotton supplied by them. Only bare expenses of preparing the shipments and freight, if the cotton is exported, will be deducted. Thus it will be seen that cotton-growers will have a sure market for their produce. Every effort should be made to ensure feed for stock during the winter by utilising all kinds of green fodder in the form of silage or hay. Those who own dairy stock will be wise to lay down permanent grasses suitable to their particular district and soil. A few acres of artificial grass, notably Rhodes grass, will support a surprisingly large number of cattle or sheep in proportion to acreage. Couch grass in the West will carry ten to twelve sheep to the acre. Coffee-picking should now be in full swing, and the berries should be pulped as they are picked. Strawberries may be transplanted. The best varieties are Pink's Prolific, Aurie, Marguerite, Annetta, Phenomenal, Hautbois, and Trollope's Victoria. Aurie and Marguerite are the earliest. In some localities, strawberry planting is finished in March, and the plants bear their first fruits in August. In others, fruit may be gathered in July, and the picking does not end until January.

Kitchen Garden.—Onions which have been planted in seed beds may now be transplanted. The ground should long since have been thoroughly cleaned, pulverised, and should be rolled previous to transplanting. Onions may still be sown in the open on clean ground. In favourable weather plant out cabbages, cauliflowers, lettuce, leeks, beetroot, endive, &c. Sowings may also be made of all these as well as of peas, broad beans, kohl-rabi, radishes, spinach, turnips, parsnips, and carrots. Dig and prepare beds for asparagus.

Flower Garden.—Planting and transplanting may be carried out simultaneously during this month in showery weather; the plants will thus be fully established before the early frosts set in. Camellias and gardenias may be safely transplanted, also such soft-wooded plants as verbenas, petunias, pentstemons, heliotrope, &c. Cut back and prune all

trees and shrubs ready for digging. Dahlia roots should be taken up and placed in a shady situation out of doors. Plant bulbs such as anemones, ranunculus, snowflakes, freesias, ixias, watsonias, iris, narcissus, daffodils, &c. Tulips will not suit the Queensland climate, but hyacinths may be tried, although success is doubtful. All shades and screens may now be removed to enable the plants to get the full benefit of the air. Fork in the mulching, and keep the walks free from weeds. Clip hedges and edgings.

Orchard Notes for May.

THE SOUTHERN COAST DISTRICTS.

The advice given respecting the handling and marketing of citrus fruits in the last two numbers of this Journal applies with equal force to this and the following months. Do not think that you can give the fruit too much care and attention; it is not possible, as the better they are handled, graded, and packed the better they will carry, and the better the price they will realise.

Continue to pay careful attention to specking, and fight the blue mould fungus everywhere. Don't let mouldy fruit lie about on the ground, hang on the trees, or be left in the packing-shed, but destroy it by burning. Keep a careful lookout for fruit fly, and sweat the fruit carefully before packing. If this be done, there will be little fear of the fruit going bad in transit or being condemned on its arrival at Southern markets. Where the orchard has not been already cleaned up, do so now, and get it in good order for winter. Surface working is all that is required, just sufficient to keep moisture in the soil; keep down undergrowth, and prevent the packing of the surface soil by trampling it down when gathering the fruit.

Keeping the orchard clean in this manner enables any fallen fruit to be easily seen and gathered, and it need hardly be stated, what has been mentioned many times before, that diseased fruit should on no account be allowed to lie about and rot on the ground, as this is one of the most frequent causes of the spreading of many fruit pests.

May is a good month to plant citrus trees, as if the ground is in good order they get established before the winter, and are ready to make a vigorous growth in spring.

Don't plant the trees, however, till the land is ready, as nothing is gained thereby, but very frequently the trees are seriously injured, as they only make a poor start, become stunted in their growth, and are soon overtaken by trees planted later, that are set out under more favourable conditions. The land must be thoroughly sweet, and in a good state of tilth—that is to say, deeply worked, and worked down fine. If this has been done, it will probably be moist enough for planting; but should there have been a dry spell, then, when the whole has been dug and the tree set therein, and the roots just covered with fine top soil, 4 to 8 gallons of water should be given to each tree, allowed to soak in, and then covered with dry soil to fill up the hole. In sound, free, sandy loams that are naturally scrub soils, holes may be dug and the trees planted before the whole of the ground is brought into a state of perfect tilth. It is, however, better to do the work prior to planting, as it can then be done in the most thorough manner; but if this is not found possible, then the sooner it is done after planting the better. If the land has been thoroughly prepared, there is no necessity to dig big holes, and in no case should the holes be dug deeper than the surrounding ground either is or is to be worked. The hole need only be big enough to allow the roots to be well spread out, and deep enough to set the tree at the same depth at which it stood when in the nursery. Plant worked trees 24 to 25 ft. apart each way, and seedlings at least 30 ft. apart each way.

Towards the end of the month cover pineapples when there is any danger of frost; dry blady grass or bush hay is the best covering. Keep the pines clean and well worked—first, to retain moisture; and, secondly, to prevent injury from frost—as a patch of weedy pines will get badly frosted when a clean patch alongside will escape without any serious injury.

Slowly acting manures—such as meatworks manure when coarse, boiling-down refuse, farm manure, or composts—way be applied during the month, as they will become slowly available for the trees' use when the spring growth takes place; but quickly-acting manures should not be applied now.

THE TROPICAL COAST DISTRICTS.

May is a somewhat slack month for fruit—pines, papaws, and granadillas are not in full fruit, the autumn crop of citrus fruit is over, and the spring crop only half-grown. Watch the young citrus fruit for Maori, and when it makes its appearance spray with the sulphide of soda wash. Keep the orchard clean, as from now till the early summer there will not be much rain, and if the orchard is allowed to run wild—viz., unworked and dirty—it is very apt to dry out, and both the trees and fruit will suffer in consequence.

Bananas should be kept well worked for this reason, and, though the fly should be slackening off, every care must still be taken to prevent any infested fruit being sent to the Southern markets.

Citrus fruits can be planted during the month, the remarks *re* this under the heading of the Southern Coast Districts being equally applicable here.

THE SOUTHERN AND CENTRAL TABLELANDS.

Get land ready for the planting of new deciduous orchards, as although there is no necessity to plant so early, it is always well to have the land in order, so as to be ready to plant at any time that the weather is suitable. The pruning of deciduous trees can commence towards the end of the month in the Stanthorpe district, and be continued during June and July. It is too early for pruning elsewhere, and too early for grapes, as a general rule. Keep the orchard clean, particularly in the drier parts. In the Stanthorpe district the growing of a crop of blue or grey field peas, or a crop of vetches between the trees in the older orchards, is recommended as a green manure. The crop to be grown as a green manure should have the soil well prepared before planting, and should be manured with not less than 4 cwt. of phosphatic manure, such as Thomas phosphate, or fine bonedust, per acre. The crop to be ploughed in when in the flowering stage. The granitic soils are naturally deficient in organic matter and nitrogen, as well as phosphoric acid, and this ploughing in of a green crop that has been manured with a phosphatic manure will have a marked effect on the soil.

Lemons will be ready for gathering in the Roma, Barcaldine, and other districts. They should be cut from the trees, sweated, and cured down, when they will keep for months, and be equal in quality to the imported Italian or Californian fruit. If allowed to remain on the trees, the fruit becomes over-large and coarse, and is only of value for peel. Only the finest fruit should be cured; the larger fruit, where the skin is thicker, is even better for peel, especially if the skin is bright and free from blemish; scaly fruit, scabby, warty, or otherwise unsightly fruit is not suitable for peel, and trees producing such require cleaning or working over with a better variety, possibly both.

The remarks *re* other citrus fruit and the work of the orchard generally, made when dealing with the coast districts, apply equally well here, especially as regards handling the crop and keeping down pests.